MHC-EX50/EX70AV/EX90

SERVICE MANUAL

AEP Model
UK Model
MHC-EX50/EX70AV/EX90

E Model
MHC-EX50/EX70AV

- MHC-EX50/EX70AV/EX90 are composed of following models. As for the service manual, it is issued for each component model, then, please refer to it.

COMPONENTS MODEL NAME FOR MHC-EX50/EX70AV/EX90

	MHC-EX50		MHC-EX70AV		MHC-EX90
	AEP, UK, G, IT, CIS	E, EA, SP, MY, HK, TH	AEP, UK, G, IT	E, EA, SP, MY, HK, TH	AEP, UK, IT
AMPLIFIER	TA-EX50		TA-EX70		TA-EX90
CD PLAYER	CDP-EX100				
TUNER	ST-EX100				
CASSETTE DECK	TC-EX90		TC-EX100	TC-EX90	
FRONT SPEAKER	—	SS-EX55G	—	SS-EX55G	SA-EX100
CENTER SPEAKER	—	—	SS-CN14		—
REAR SPEAKER	—	—	SS-SR12		—

- Abbreviations
G : German
EA : Saudi Arabia
MY : Malaysia
HK : Hong Kong
IT : Italian
SP : Singapore
TH : Thailand

SPECIFICATIONS

General

Power requirements
220-230 V AC, 50/60Hz (AEP, UK, G, IT, CIS model)
220V AC, 50/60Hz (TH model)
110-120V or 220-240V AC, 50/60Hz
Adjustable with the voltage selector
(E, EA, SP, MY, HK model)

Power consumption
145W (System)
(EX50 : E, EA, SP, MY, HK, TH model)
135W (System)
(EX50 : AEP, UK, G, IT model)
210W (System) (EX70AV model)
155W (Active speaker not included) (EX90 model)

Supplied accessories

AM loop aerial (1)
Remote RM-SE5 (1) (EX50/EX90 model)
RM-SE7AV (1) (EX70AV model)
Sony SUM-3 (NS) batteries (2)
FM lead aerial (1)
Flat cord (1)
Audio cords (4)
Speaker connecting cord
Feet for center speaker (4) (EX70AV model)

Design and specifications are subject to change without notice.

MINI Hi-Fi COMPONENT SYSTEM

SONY®

PARTS LIST

NOTE :
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- Abbreviations

G : German model
IT : Italian model
EA : Saudi Arabia model
SP : Singapore model
MY : Malaysia model
TH : Thailand model
HK : Hong Kong model

ACCESSORIES & PACKING MATERIALS

	Part No.	Description	Remark
	1-473-591-11	COMMANDER, STANDARD (RM-SE5) (EX50/EX90)	
*	1-473-592-11	COMMANDER, STANDARD (RM-SE7AV) (EX70AV)	
	1-501-659-41	ANTENNA (FM) (E, EA, MY, SP, HK, TH)	
	1-501-721-11	ANTENNA (LOOP)	
	1-501-807-21	ANTENNA (FM) (AEP, UK, G, IT, CIS)	
	1-558-271-11	CORD, CONNECTION (AUDIO 108cm)	
⚠	1-765-293-11	CORD, POWER (SA) (EX90 : AEP, G, IT)	
	1-769-170-11	CORD (WITH CONNECTOR) (7P) (TA-ST-TC-CDP)	
	1-769-307-11	CORD, SPEAKER (TA-SS) (2m) (EX50 : E, EA, SP, MY, HK, TH / EX70AV : E, EA, SP, MY, HK, TH)	
⚠	1-769-312-21	CORD, POWER (SA) (EX90 : UK)	
	1-769-433-11	CORD, SPEAKER (SURROUND) (10m) (EX70AV)	
	1-769-433-21	CORD, SPEAKER (SURROUND) (2.5m) (EX70AV)	
	1-775-512-21	CORD, SPEAKER CONNECTION (TA-SA) (2m) (EX90)	
	3-810-489-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX50 : AEP)	
	3-810-489-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX50 : AEP)	
	3-810-489-31	MANUAL, INSTRUCTION (ENGLISH) (EX50 : UK)	
	3-810-489-41	MANUAL, INSTRUCTION (GERMAN) (EX50 : G)	
	3-810-489-51	MANUAL, INSTRUCTION (ITALIAN) (EX50 : IT)	
	3-810-489-61	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX50 : AEP)	
	3-810-489-71	MANUAL, INSTRUCTION (ENGLISH, RUSSIAN) (EX50 : CIS)	
	3-810-489-81	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE) (EX50 : E, EA, MY, SP, HK,TH)	
	3-810-489-91	MANUAL, INSTRUCTION (ARABIC) (EX50 : EA)	
	3-810-490-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX70AV : AEP)	
	3-810-490-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX70AV : AEP, IT)	
	3-810-490-31	MANUAL, INSTRUCTION (ENGLISH) (EX70AV : UK)	
	3-810-490-41	MANUAL, INSTRUCTION (GERMAN) (EX70AV : G)	
	3-810-490-51	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX70AV : AEP)	
	3-810-490-61	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE) (EX70AV : E, EA, MY, SP, HK,TH)	
	3-810-490-71	MANUAL, INSTRUCTION (ARABIC) (EX70AV : EA)	
	3-810-491-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX90 : AEP)	
	3-810-491-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX90 : AEP,IT)	
	3-810-491-31	MANUAL, INSTRUCTION (ENGLISH) (EX90 : UK)	
	3-810-491-41	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX90 : AEP)	
*	3-933-134-01	CUSHION (LOWER) (TC)	
*	3-933-164-01	CUSHION (UPPER) (TC)	
	4-972-322-01	FOOT (Y) (SURROUND) (EX70AV)	
*	4-972-989-01	CUSHION (SURROUND) (EX70AV)	
*	4-979-172-01	CUSHION (UPPER) (SA) (EX90)	
*	4-979-173-01	CUSHION (LOWER) (SA) (EX90)	
*	4-980-537-01	CUSHION (UPPER) (TA)	
*	4-980-538-01	CUSHION (LOWER) (TA)	
*	4-980-539-01	CUSHION (UPPER) (ST)	
*	4-980-540-01	CUSHION (LOWER) (ST)	
*	4-980-541-01	CUSHION (UPPER) (CD)	
*	4-980-542-01	CUSHION (LOWER) (CD)	
*	4-980-544-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : E, SP, MY, HK)	
*	4-980-545-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : EA)	
*	4-980-546-01	INDIVIDUAL CARTON (TA-TC) (EX70AV : AEP,UK,G,IT)	
*	4-980-548-01	INDIVIDUAL CARTON (TA-TC) (EX50 : AEP,UK,G,IT,CIS)	
*	4-980-549-01	INDIVIDUAL CARTON (TA-TC) (EX90)	
*	4-980-554-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : E, SP, MY, HK)	
*	4-980-555-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : EA)	
	4-980-737-01	LID, BATTERY CASE (for RM-SE5/RM-SE7AV)	
*	4-980-788-01	CUSHION (EX) (SS) (EX50 : E,EA,SP,MY, HK,TH/EX70AV : E,EA,SP,MY,HK,TH)	
*	4-982-100-01	INDIVIDUAL CARTON (ST-CDP) (AEP,UK,G,IT,CIS)	
*	4-982-441-01	INDIVIDUAL CARTON (SA) (EX90)	
*	4-983-403-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : TH)	
*	4-983-404-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : TH)	

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Home A&V Products Div.

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TA-EX50/EX90

SERVICE MANUAL

AEP Model
UK Model
TA-EX50/EX90
E Model
TA-EX50

TA-EX50/EX90 is the amplifier section
in MHC-EX50, MHC-EX90.

Photo : TA-EX90

SPECIFICATIONS

DIN power output 45 W + 45 W (6 ohms, at 1 kHz, DIN)
(EX50: AEP, UK, G, IT, CIS models)
50 W + 50 W (6 ohms, at 1 kHz, DIN) (EX90)

Continuous RMS power output
55 W + 55 W (6 ohms, at 1 kHz, 10% THD)
(EX50: AEP, UK, G, IT, CIS models)
50 W + 50 W (6 ohms, at 1 kHz, 5% THD)
(EX50: EXCEPT AEP, UK, G, IT, CIS models)
65 W + 65 W (6 ohms, at 1 kHz, 10% THD)
(EX90)

Music power output
95 W + 95 W (6 ohms, at 1 kHz, 10% THD)
(EX50: AEP, UK, G, IT, CIS models)
120 W + 120 W (6 ohms, at 1 kHz, 10% THD)
(EX90)

Input	Jack type	Sensitivity	Impedance
CD	Phono	450 mV	47 kilohms
MD	Phono	450 mV	47 kilohms
TUNER	Phono	250 mV	47 kilohms
VIDEO1	Phono	250 mV	47 kilohms
VIDEO2/ AUX	Phono	250 mV	47 kilohms
TAPE	Phono	250 mV	47 kilohms

Output	Jack type	Voltage	Impedance
MD	Phono	250 mV	1 kilohm
VIDEO1	Phono	250 mV	1 kilohm
TAPE	Phono	250 mV	1 kilohm
PHONES	Stereo phone	–	Accepts headphones of 8 ohms or more

Dimensions
Approx. 280 x 122.5 x 290 mm
(11 1/8 x 4 7/8 x 11 1/2 in) (w/h/d)
incl. projecting parts and controls

Mass Approx. 5.3 kg
(11 lb 10 oz)

General

Power requirements
220 – 230 V AC, 50/60 Hz (EX50: AEP, UK, G, IT, CIS, EX90 models)
220 V AC, 50/60 Hz (EX50: TH)
110 – 120 V or 220 – 240 V AC, 50/60 Hz
Adjustable with the voltage selector
(EX50: EXCEPT AEP, UK, G, IT, CIS, TH models)

Power consumption
135 W (system)
(EX50: AEP, UK, G, IT, CIS models)
145 W (system)
(EX50: EXCEPT AEP, UK, G, IT, CIS models)
155 W (active speaker not included) (EX90)

Design and specifications are subject to change without notice.

- Abbreviation
  G : German model.
  IT : Italian model.
  TH : Thailand model.

INTEGRATED STEREO AMPLIFIER

SONY®

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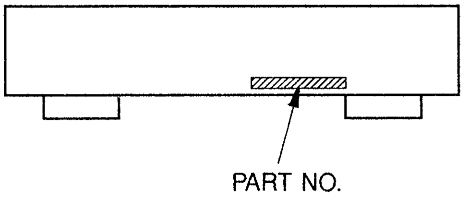
MODEL IDENTIFICATION

— BACK PANEL —



MODEL	PARTS No.
EX50 : E model	4-978-966-0☐
Malaysia model	
Singapore model	
Hong Kong model	4-978-966-1☐
Saudi Arabia model	4-978-966-3☐
Thailand model	4-978-966-4☐
AEP model	4-978-969-0☐
German model	4-978-969-1☐
Italian model	4-978-969-2☐
UK model	4-978-969-3☐
CIS model	4-978-969-5☐
EX90 : AEP model	4-978-974-0☐
Italian model	4-978-974-2☐
UK model	4-978-974-3☐

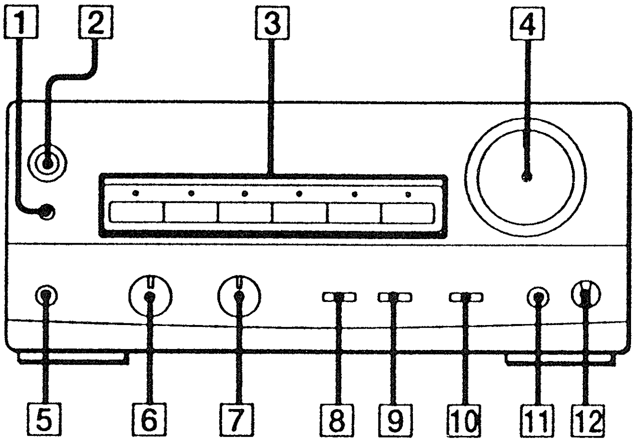
SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1
GENERAL

This section is extracted from instruction manual.

Identifying the Parts

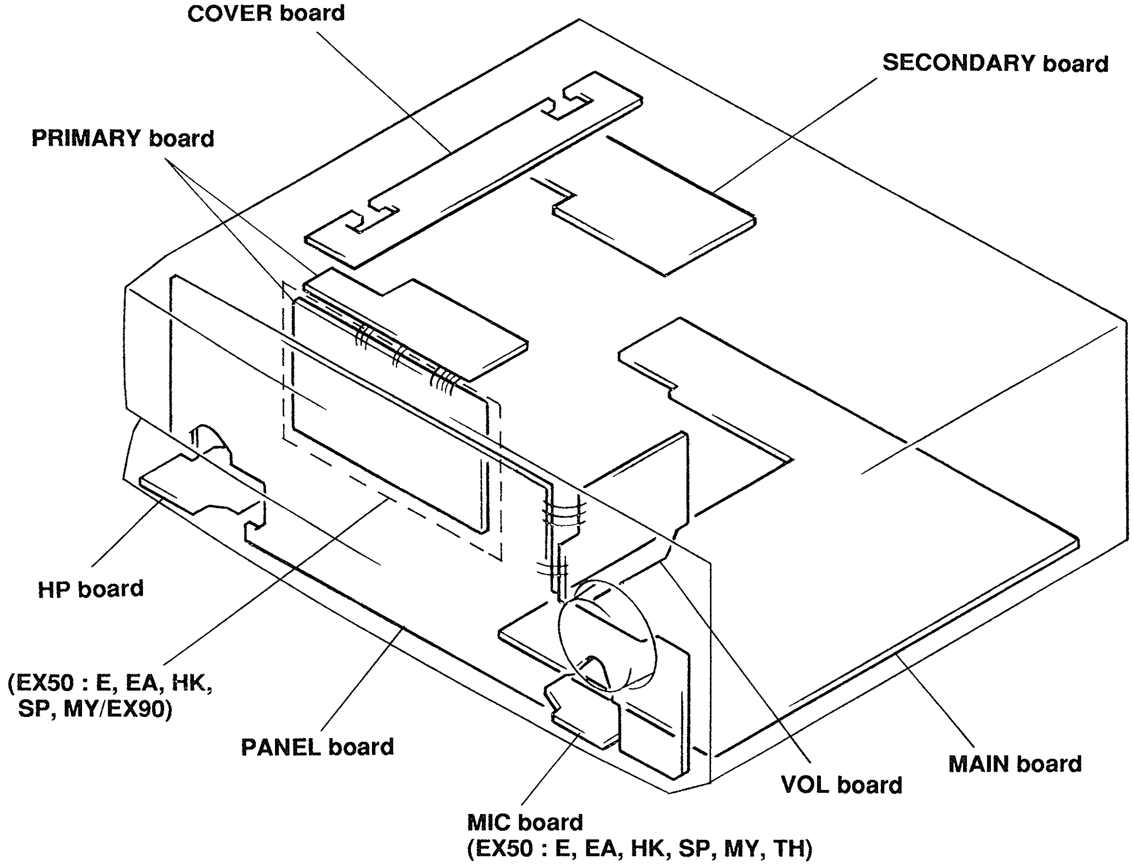


1 Remote sensor
2 SYSTEM POWER switch and ON/STANDBY indicator (7)
  The indicator remains lit as long as the AC power cord is connected to a wall outlet.
3 Function buttons* (17, 21, 22)
  VIDEO 1 (22)
  VIDEO 2/AUX (22)
  TAPE
  MD
  CD (13, 17, 21)
  TUNER (17)
4 VOLUME control (5, 7, 18, 19)
5 PHONES jack (18, 22)
6 BASS control (18)
7 TREBLE control (18)
8 SOURCE DIRECT button* (18)
9 MUTING button* (18)
10 KARAOKE PON button* (21)
  (EX50: E, EA, HK, SP, MY, TH models)
11 MIX MIC jack (phone jack) (21, 22)
  (EX50: E, EA, HK, SP, MY, TH models)
12 MIC LEVEL control (21)
  (EX50: E, EA, HK, SP, MY, TH models)

- Abbreviation
  EA : Saudi Arabia model.
  HK : Hong Kong model.
  SP : Singapore model.
  MY : Malaysia model.
  TH : Thailand model.

SECTION 2
DIAGRAMS

2-1. CIRCUIT BOARDS LOCATION


COVER board
SECONDARY board
PRIMARY board
HP board
(EX50 : E, EA, HK, SP, MY/EX90)
PANEL board
MIC board
(EX50 : E, EA, HK, SP, MY, TH)
VOL board
MAIN board

- Abbreviation
  - EA : Saudi Arabia model.
  - HK : Hong Kong model.
  - SP : Singapore model.
  - MY : Malaysia model.
  - TH : Thailand model.

2-2. IC PIN FUNCTION

- **IC101 SYSTEM CONTROL (M37471M2-461SP)**

Pin No.	Pin Name	I/O	Function
1	——	–	Not used. (Ground)
2	——	–	
3	——	–	
4	——	–	
5	POWER RELAY	O	Power relay control output.
6	LINE MUTE 2	O	Pre amp mute output.
7	LINE MUTE 1	O	Line mute output.
8	VOL UP	O	Volume up control output.
9	VOL DOWN	O	Volume down control output.
10	K-PON	O	KARAOKE PON control output.
11	——	–	Not used. (Ground)
12	——	–	
13	——	–	
14	——	–	
15	MIC IN	I	Microphone detect input. (not used: +5V)
16	KEY 1	I	Key input. (analog)
17	KEY 0	I	
18	VREF	–	Reference voltage input (+5V).
19	XIN	I	System clock input (8 MHz).
20	XOUT	O	System clock output (8 MHz).
21	Vss	–	Ground
22	Vcc	–	Power supply (+5V).
23	MODEL	I	Destination identification input.
24	——	–	Not used. (Ground)
25	$\overline{\text{RESET}}$	I	Reset signal input.
26	——	–	Not used. (Ground)
27	AU BUS IN	I	Audio bus signal input.
28	SIRCS IN	I	SIRCS signal input.
29	——	–	Not used. (Ground)
30	AU BUS OUT	O	Audio bus signal output.
31	AFUNC 0	O	Function control output.
32	AFUNC 1	O	
33	AFUNC 2	O	
34	VIDEO 1	O	Function LED control output.
35	VIDEO 2	O	
36	TAPE	O	
37	MD	O	
38	CD	O	
39	TUNER	O	
40	–20 dB MUTE	O	–20 dB muting control output.
41	SOURCE DIRECT	O	SOURCE DIRECT control output.
42	——	–	Not used. (Ground)

- **Semiconductor Location**

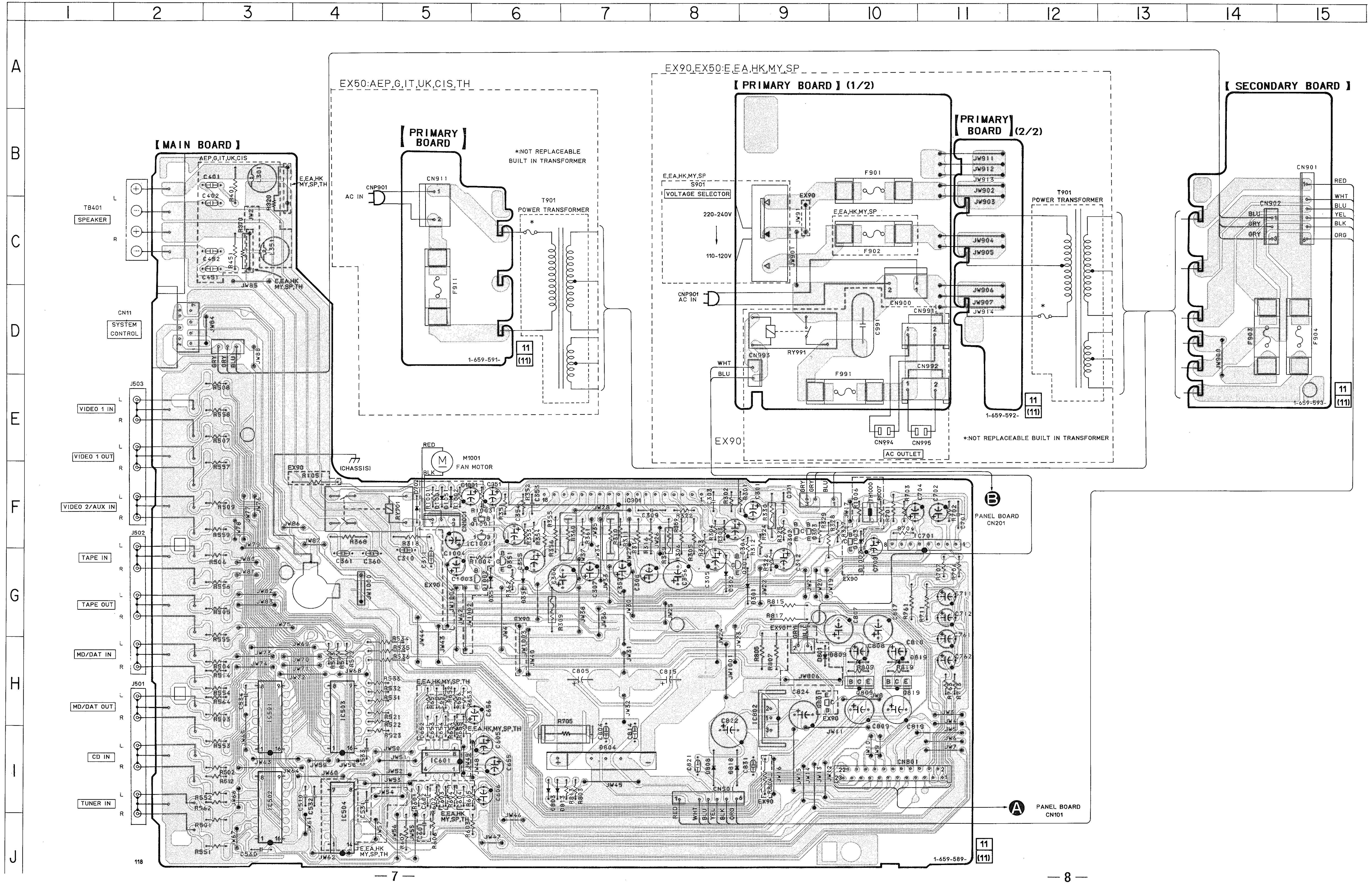
Ref. No.	Location
D301	G-9
D302	G-8
D351	G-6
D352	G-6
D702	F-5
D801	H-9
D803	I-6
D804	I-7
D808	I-8
D809	H-10
D813	I-6
D818	I-8
D819	H-10
D1001	F-5
D1002	F-10
D1051	F-5
IC301	F-7
IC501	H-3
IC502	I-3
IC503	H-4
IC504	I-4
IC601	I-5
IC701	F-11
IC802	H-9
IC1001	F-6
Q301	G-8
Q302	F-9
Q303	F-9
Q351	G-6
Q801	H-9
Q809	H-10
Q819	H-10
Q1001	F-6
Q1002	G-6
Q1003	F-10

Note:

- ▨ : Pattern from the side which enable seeing.
- Abbreviation
  - G : German model.
  - IT : Italian model.
  - EA : Saudi Arabia model.
  - HK : Hong Kong model.
  - SP : Singapore model.
  - MY : Malaysia model.
  - TH : Thailand model.

2-3. PRINTED WIRING BOARD — MAIN SECTION —

• See page 4 for Circuit Boards Location.


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J
EX50:AEP,G,IT,UK,CIS,TH
EX90,EX50:E,EA,HK,MY,SP
[MAIN BOARD]
[PRIMARY BOARD]
[PRIMARY BOARD] (1/2)
[PRIMARY BOARD] (2/2)
[SECONDARY BOARD]
TB401 SPEAKER
CN11 SYSTEM CONTROL
J503 VIDEO 1 IN
VIDEO 1 OUT
VIDEO 2/AUX IN
J502 TAPE IN
TAPE OUT
MD/DAT IN
J501 MD/DAT OUT
CD IN
TUNER IN
CNP901 AC IN
CN911
F911
T901 POWER TRANSFORMER
*:NOT REPLACEABLE BUILT IN TRANSFORMER
1-659-591-
S901 VOLTAGE SELECTOR
220-240V
110-120V
F901
F902
F991
RY991
CN900
CN991
CN992
CN993
CN994 CN995 AC OUTLET
1-659-592-
*:NOT REPLACEABLE BUILT IN TRANSFORMER
CN901 RED WHT BLU YEL BLK ORG
CN902
F903 F904
1-659-593-
M1001 FAN MOTOR
(CHASSIS)
PANEL BOARD CN201
PANEL BOARD CN101
IC501 IC502 IC503 IC504 IC601 IC701 IC802
1-659-589-
11 (11)

2-4. SCHEMATIC DIAGRAM — MAIN SECTION —

【MAIN BOARD】
·IC BLOCK DIAGRAM
·IC503 MC14052BCP
·IC701 µPC1237HA
OVER LOAD DET
OFFSET DET
LATCH/AUTORESET
AC OFF DET
F/F
Vcc ON MUTE
IC501 INPUT SELECTOR
IC502 INPUT SELECTOR
IC503 OUTPUT SELECTOR
IC504 KARAOKE PON SWITCH
IC601 AMP
IC301 POWER AMP
IC701 PROTECTOR
IC1001 REG
IC802 +5V REG
Q302, 303 POWER ON/OFF SWITCH
Q801, 351 OVER LOAD DET
Q1001, 1002 OVER LOAD DET
Q1003 TEMPERATURE DET
M1001 FAN MOTOR
TB401 SPEAKER
RY701
TUNER IN
CD IN
MD/DAT OUT
MD/DAT IN
TAPE OUT
TAPE IN
VIDEO2/AUX IN
VIDEO1 OUT
VIDEO1 IN
J501
J502
J503
(CHASSIS)
EX50: AEP, G, IT, UK, CIS, TH
【PRIMARY BOARD】
T901 POWER TRANSFORMER
AC IN
∗ NOT REPLACEABLE
: BUILT IN TRANSFORMER
EX90
EX50: E, EA, HK, MY, SP
【PRIMARY BOARD】 (1/2)
【PRIMARY BOARD】 (2/2)
【SECONDARY BOARD】
VOLTAGE SELECTOR
AC OUTLET
Q801 RELAY SWITCH
CN11 SYSTEM CONTROL
B VOL BOARD CN201
A PANEL BOARD CN101
R602, 652
27K E, EA, HK, MY, SP, TH
47K AEP, G, IT, UK, CIS
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q

NOTE

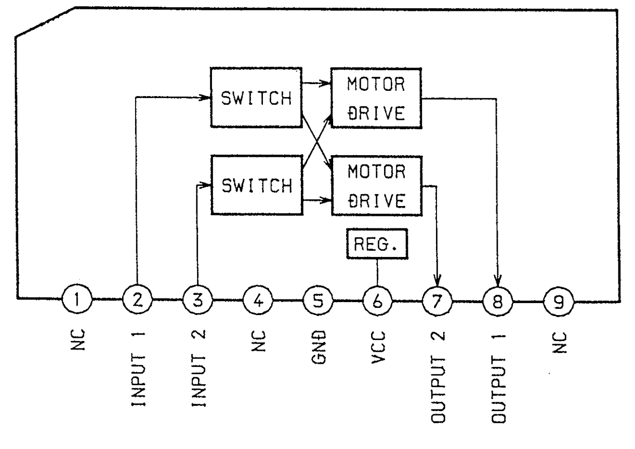
- All capacitors are in µF unless otherwise noted. pF: µµF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- :nonflammable resistor.
- :fusible resistor.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

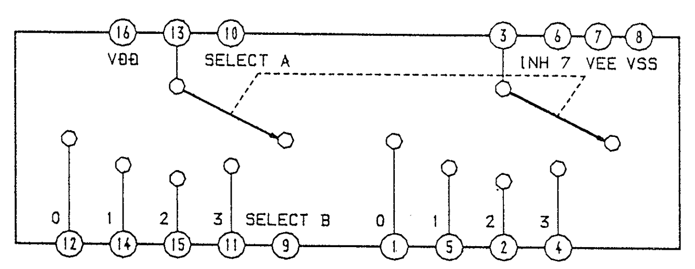
- B+ :B+ Line.
- B− :B− Line.
- ☐ :panel designation.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: TUNER mode
- Voltages are taken with a VOM (10M Ω/V)
  Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ :FM
  ▷ :MIC
- Abbreviation
  G :German model.
  IT :Italian model.
  EA :Saudi Arabia model.
  HK: Hong Kong model.
  SP :Singapore model.
  MY :Malaysia model.
  TH :Thailand model.

- **IC Block Diagrams**

IC104 BA6208

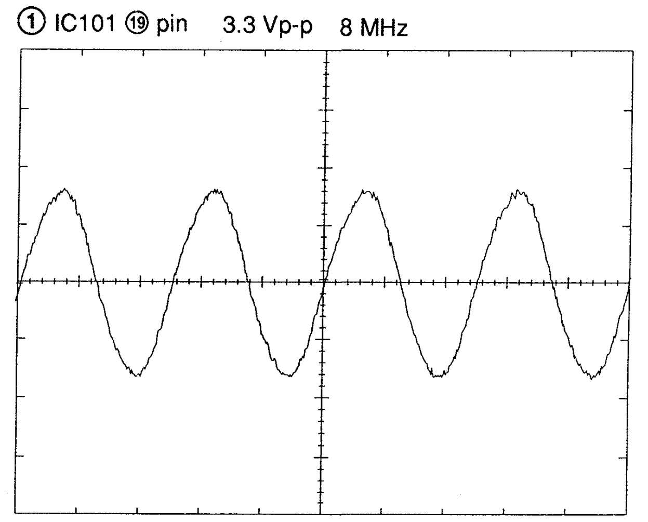

SWITCH
MOTOR DRIVE
SWITCH
MOTOR DRIVE
REG.
1
2
3
4
5
6
7
8
9
NC
INPUT 1
INPUT 2
NC
GND
VCC
OUTPUT 2
OUTPUT 1
NC

IC202 MC14052BCP


VDD
SELECT A
INH 7 VEE VSS
0 1 2 3 SELECT B 0 1 2 3
16
10
12
14
15
11
9
13
1
5
2
4
3
6
7
8

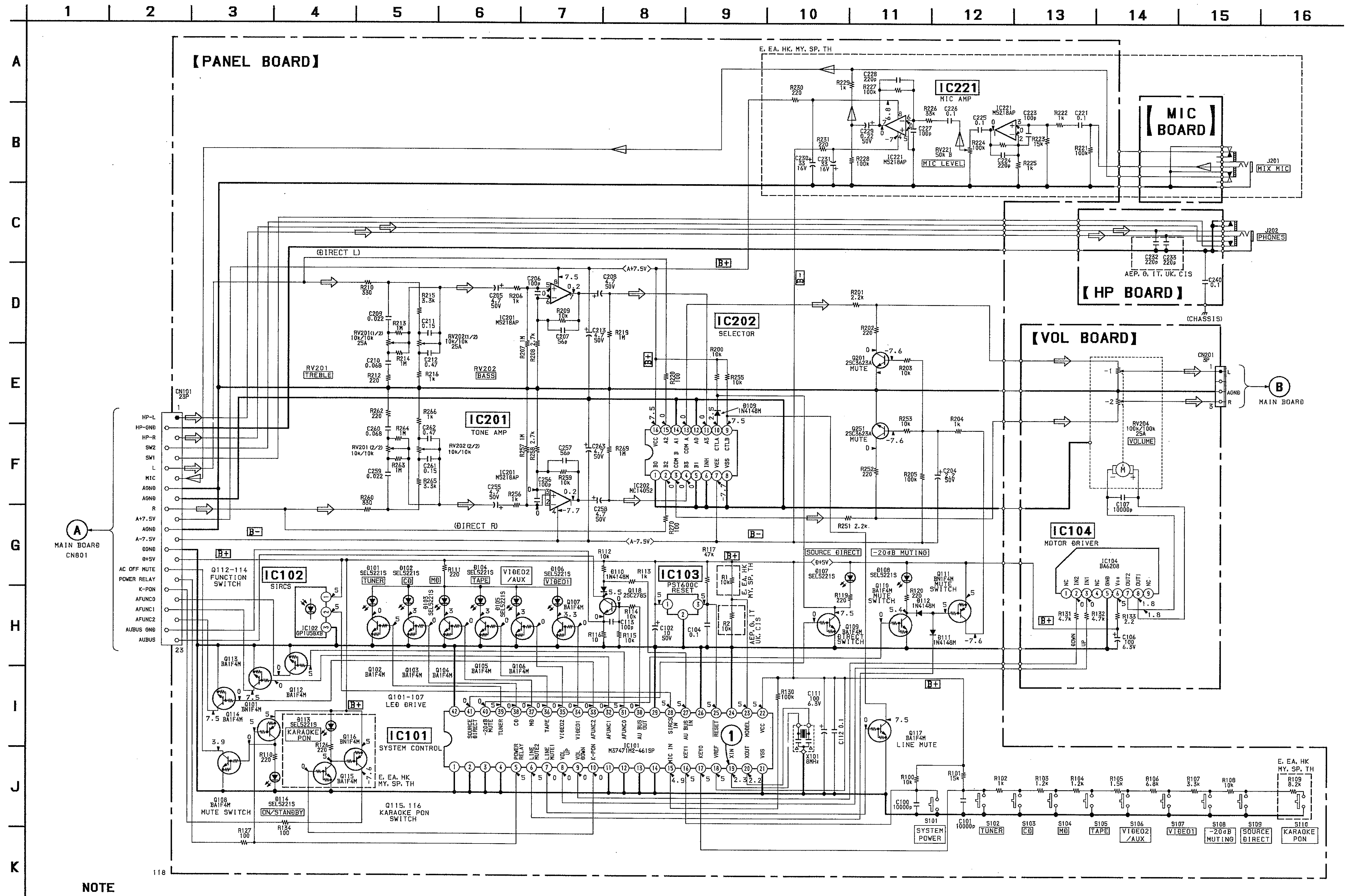
- **Waveform**

① IC101 ⑲ pin 3.3 Vp-p 8 MHz



2-5. SCHEMATIC DIAGRAM — PANEL SECTION —

- See page 5 for IC Pin Function. (IC101)


1
2
3
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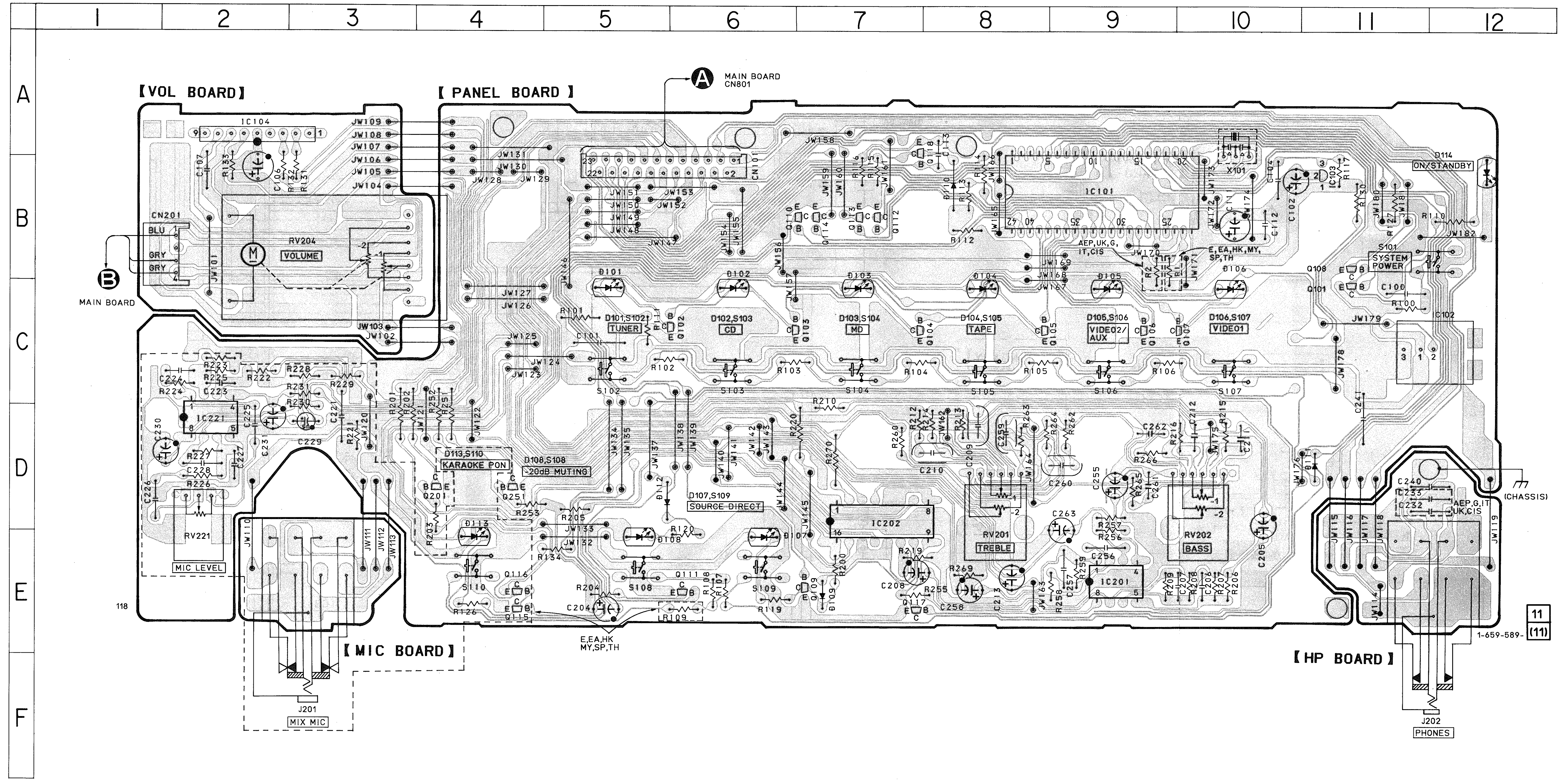
11
12
13
14
15
16
A
B
C
D
E
F
G
H
I
J
K
[PANEL BOARD]
[MIC BOARD]
[HP BOARD]
[VOL BOARD]
IC221
MIC AMP
IC202
SELECTOR
IC201
TONE AMP
IC102
IC103
IC104
MOTOR DRIVER
IC101
SYSTEM CONTROL
A
MAIN BOARD CN801
B
MAIN BOARD
Q108
MUTE SWITCH
D114
ON/STANDBY
Q115, 116
KARAOKE PON SWITCH
S101
SYSTEM POWER
S102
TUNER
S103
CD
S104
MD
S105
TAPE
S106
VIDEO2 /AUX
S107
VIDEO1
S108
-20dB MUTING
S109
SOURCE DIRECT
S110
KARAOKE PON

NOTE

- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ :internal component.
- B+ :B+ Line.
- B- :B- Line.
- ▭ :panel designation.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark:TUNER mode
- Voltages are taken with a VOM (10MΩ/V).
  Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ :FM
  ▷ :MIC
- Abbreviation
  G :German model.
  IT :Italian model.
  EA :Saudi Arabia model.
  HK :Hong Kong model.
  SP :Singapore model.
  MY :Malaysia model.
  TH :Thailand model.

2-6. PRINTED WIRING BOARD — PANEL SECTION —

- See page 4 for Circuit Boards Location.


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
[VOL BOARD]
[PANEL BOARD]
A
MAIN BOARD CN801
B
MAIN BOARD
CN201
BLU
GRY
GRY
RV204
VOLUME
IC104
IC101
D114
ON/STANDBY
S101
SYSTEM POWER
D101,S102
TUNER
D102,S103
CD
D103,S104
MD
D104,S105
TAPE
D105,S106
VIDEO2/AUX
D106,S107
VIDEO1
D113,S110
KARAOKE PON
D108,S108
-20dB MUTING
D107,S109
SOURCE DIRECT
IC221
RV221
MIC LEVEL
IC202
RV201
TREBLE
IC201
RV202
BASS
[MIC BOARD]
J201
MIX MIC
[HP BOARD]
J202
PHONES
(CHASSIS)
AEP,UK,G,IT,CIS
E,EA,HK,MY,SP,TH
11
(11)
1-659-589-

- **Semiconductor Location**

Ref. No.	Location
D101	C-5
D102	C-6
D103	C-7
D104	C-8
D105	C-9
D106	C-10
D107	E-6
D108	E-5
D109	E-7
D110	B-8
D111	D-11
D112	D-5
D113	E-4
D114	B-12
IC101	B-9
IC102	C-12
IC103	B-11
IC104	A-2
IC201	E-9
IC202	D-7
IC221	D-2
Q101	C-11
Q102	C-6
Q103	C-7
Q104	C-7
Q105	C-8
Q106	C-9
Q107	C-10
Q108	B-11
Q109	E-7
Q110	B-7
Q111	E-6
Q112	B-7
Q113	B-7
Q114	B-7
Q115	E-4
Q116	E-4
Q117	E-7
Q118	A-7
Q201	D-4
Q251	D-4

Note:

- △ : internal component.
- ▨ : Pattern from the side which enable seeing.
- Abbreviation
  G : German model.
  IT : Italian model.
  EA : Saudi Arabia model.
  HK : Hong Kong model.
  SP : Singapore model.
  MY : Malaysia model.
  TH : Thailand model.

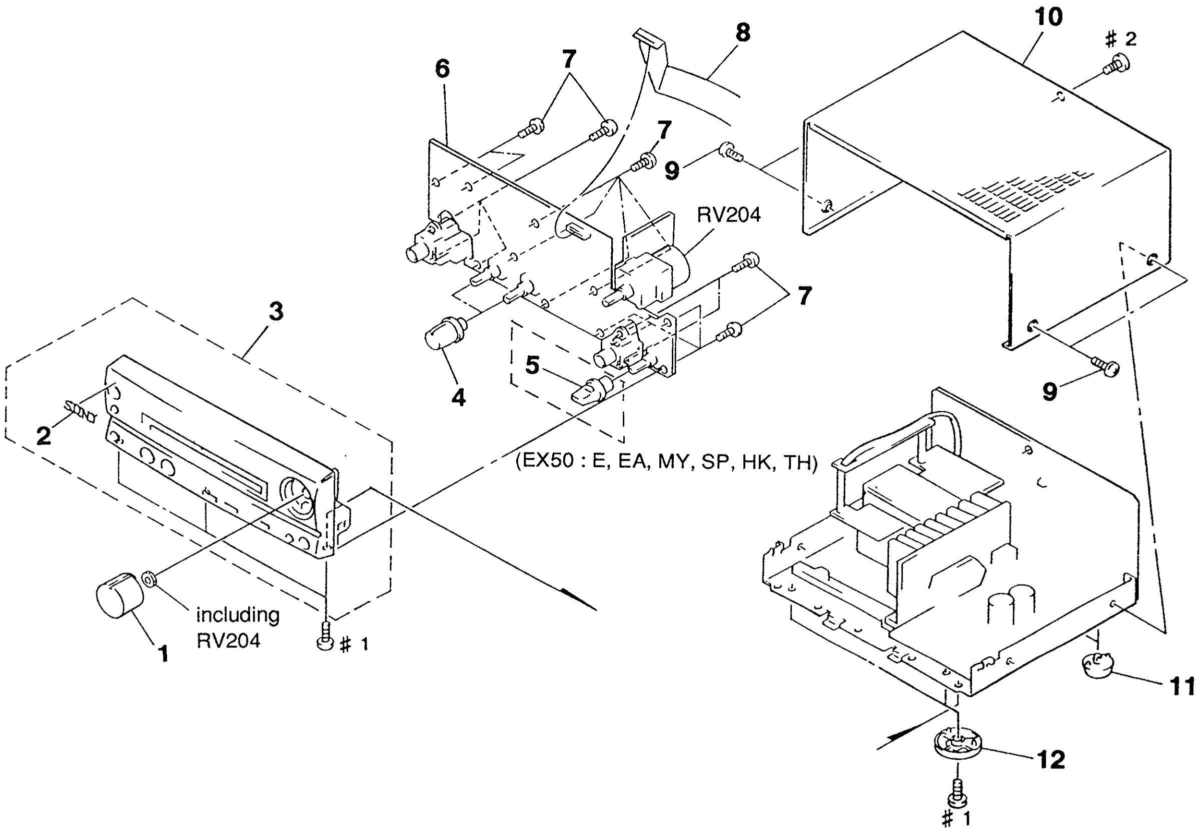
SECTION 3
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts color Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  HK : Hong Kong model
  SP : Singapore model
  MY : Malaysia model
  TH : Thai model

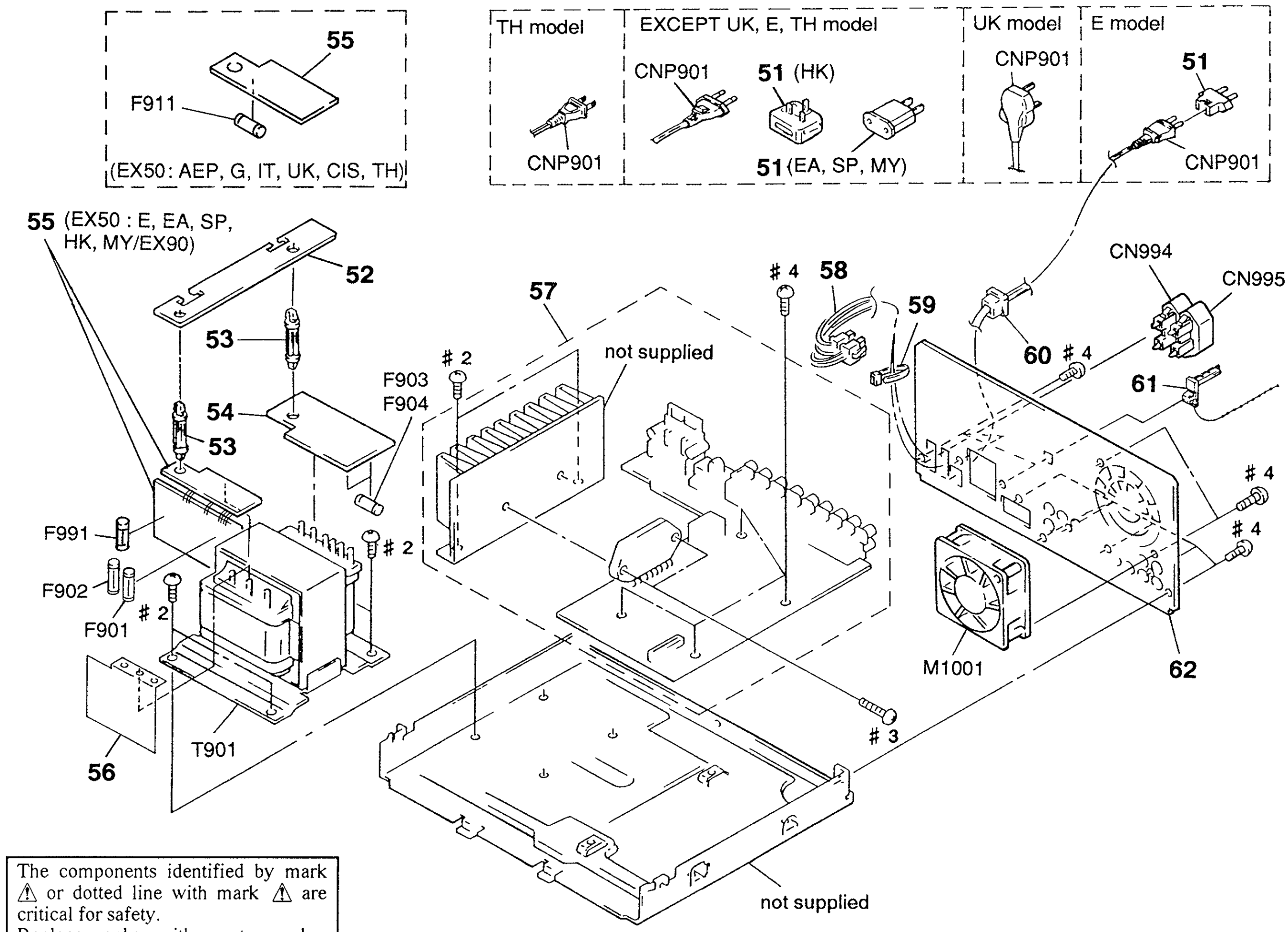
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

3-1. FRONT PANEL AND CASE SECTION



Ref. No.	Part No.	Description	Remark
1	4-970-944-21	KNOB (VOL) (BLACK)... (BLACK)	
1	4-970-944-31	KNOB (VOL) (GRAY)... (SILVER)	
2	4-962-708-11	EMBLEM (4-A), SONY	
3	X-4946-596-1	PANEL ASSY (GA), FRONT (GRAY)... (SILVER) (EX50:E, EA, MY, SP, HK)	
3	X-4946-597-1	PANEL ASSY (AEP) (S), FRONT (GRAY)... (SILVER) (EX50:AEP, UK, G, IT, CIS)	
3	X-4946-599-1	PANEL ASSY (AEP), FRONT (GRAY)... (SILVER) (EX90)	
3	X-4946-833-1	PANEL ASSY (AEP) (B), FRONT (BLACK)... (BLACK) (EX50:AEP, UK, G, IT)	
3	X-4946-954-1	PANEL ASSY, FRONT (GRAY)... (SILVER) (EX50:TH)	
4	4-970-965-21	KNOB (TONE) (BLACK)... (BLACK)	
4	4-970-965-31	KNOB (TONE) (GRAY)... (SILVER)	
5	4-973-043-31	KNOB (KR) (EX50:E, EA, MY, SP, HK, TH)	
* 6	A-4378-852-A	PANEL BOARD, COMPLETE (EX50:E, EA, MY, SP, HK, TH)	
* 6	A-4378-855-A	PANEL BOARD, COMPLETE (EX90)	
* 6	A-4378-859-A	PANEL BOARD, COMPLETE (EX50:AEP, UK, G, IT, CIS)	
7	4-951-620-01	SCREW (2.6X8), +BVTP	
8	1-773-187-11	WIRE (FLAT TYPE) (23 CORE)	
9	3-363-099-01	SCREW (CASE 3 TP2)	
10	3-919-558-71	CASE (BLACK)... (BLACK) (EX50)	
10	4-978-245-11	CASE (GRAY)... (SILVER)	
10	4-978-245-31	CASE (GRAY)... (SILVER) (EX90)	
11	4-965-822-01	FOOT	
12	4-977-699-11	LEG (F)	
RV204	1-223-811-11	RES, VAR, CARBON 100K/100K (VOLUME)	

3-2. CHASSIS SECTION


55
F911
(EX50: AEP, G, IT, UK, CIS, TH)
TH model
CNP901
EXCEPT UK, E, TH model
CNP901
51 (HK)
51 (EA, SP, MY)
UK model
CNP901
E model
51
CNP901
55 (EX50 : E, EA, SP, HK, MY/EX90)
52
53
54
53
F991
F902
F901
# 2
56
T901
F903
F904
# 2
57
not supplied
# 4
58
59
CN994
CN995
60
# 4
61
# 4
# 4
M1001
62
# 3
not supplied

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
⚠51	1-569-007-11	ADAPTER, CONVERSION 2P (EX50:E)	
⚠51	1-569-008-11	ADAPTER, CONVERSION 2P (EX50:EA, MY, SP)	
⚠51	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (EX50:HK)	
* 52	1-659-594-11	COVER BOARD	
* 53	4-385-948-01	HOLDER, PCB	
* 54	1-659-593-11	SECONDARY BOARD	
* 55	1-659-591-11	PRIMARY BOARD (EX50:AEP, UK, G, IT, CIS, TH)	
* 55	1-659-592-11	PRIMARY BOARD (EX50:E, EA, HK, MY, SP/EX90)	
* 56	4-978-612-02	SHEET, INSULATING	
* 57	A-4364-898-A	MAIN ASSY BOARD, COMPLETE (EX50:TH)	
* 57	A-4378-853-A	MAIN BOARD, COMPLETE (EX50:E, EA, MY, SP, HK, TH)	
* 57	A-4378-856-A	MAIN BOARD, COMPLETE (EX90)	
* 57	A-4378-860-A	MAIN BOARD, COMPLETE (EX50:AEP, UK, G, IT, CIS)	
58	1-776-429-11	CORD (WITH CONNECTOR)(EX90)	
59	3-655-653-01	BAND (TAITON), BINDING (EX90:UK)	
* 60	3-703-244-00	BUSHING (2104), CORD (EX50:AEP, UK, G, IT, CIS, EA, MY, SP, HK/EX90)	
60	3-703-571-11	BUSHING (S)(4516), CORD (EX50:E, TH)	
61	4-956-370-02	BAND, PLUG FIXED (EX50:UK, HK/EX90:UK)	
* 62	4-978-966-01	PANEL, BACK (EX50:E, MY, SP)	
* 62	4-978-966-11	PANEL, BACK (EX50:HK)	
* 62	4-978-966-31	PANEL, BACK (EX50:EA)	
* 62	4-978-966-41	PANEL, BACK (EX50:TH)	
* 62	4-978-969-01	PANEL, BACK (EX50:AEP)	
* 62	4-978-969-11	PANEL, BACK (EX50:G)	
* 62	4-978-969-21	PANEL, BACK (EX50:IT)	
* 62	4-978-969-31	PANEL, BACK (EX50:UK)	
* 62	4-978-969-51	PANEL, BACK (EX50:CIS)	
* 62	4-978-974-01	PANEL, BACK (EX90:AEP)	
* 62	4-978-974-21	PANEL, BACK (EX90:IT)	
* 62	4-978-974-31	PANEL, BACK (EX90:UK)	
⚠CN994	1-526-794-11	OUTLET, AC (AC OUTLET)(EX90)	
⚠CN995	1-526-794-11	OUTLET, AC (AC OUTLET)(EX90)	
⚠CNP901	1-575-651-11	CORD, POWER (EX50:AEP, G, IT, CIS, EA, MY, SP, HK/EX90:AEP, IT)	
⚠CNP901	1-575-653-11	CORD, POWER (EX50:E)	
⚠CNP901	1-751-326-31	CORD, POWER (EX50:TH)	
⚠CNP901	1-751-520-21	CORD, POWER (EX50:UK/EX90:UK)	
⚠F901	1-532-078-00	FUSE, TIME LAG (T1.0AL, 250V) (EX50:E, EA, MY, SP, HK, TH)	
⚠F901	1-532-285-00	FUSE, TIME LAG (T1.25AL, 250V)(EX90)	
⚠F902	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V) (EX50:E, EA, MY, SP, HK)	
⚠F903	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V)	
⚠F904	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V)	
⚠F911	1-532-078-00	FUSE, TIME LAG (T1.0AL, 250V)(EX50:TH)	
⚠F911	1-532-285-00	FUSE, TIME LAG (T1.25AL, 250V) (EX50:AEP, UK, G, IT, CIS)	
⚠F991	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V)(EX90)	
⚠M1001	1-698-720-11	MOTOR, FAN (DC)(EX90)	
⚠T901	1-429-311-11	TRANSFORMER, POWER (EX50:E, EA, MY, SP, HK, TH)	
⚠T901	1-429-312-11	TRANSFORMER, POWER(EX90)	
⚠T901	1-429-484-11	TRANSFORMER, POWER(EX50:AEP, UK, G, IT, CIS)	

SECTION 4
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- COILS
  uH : μH
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  HK : Hong Kong model
  SP : Singapore model
  MY : Malaysia model
  TH : Thailand model

Ref.No.	Part No.	Description	Remark
*	1-659-594-11	COVER BOARD	
		***********	
**			
*	A-4378-853-A	MAIN BOARD, COMPLETE	(EX50:E, EA, HK, MY, SP, TH)
		***************************************	
*	A-4378-856-A	MAIN BOARD, COMPLETE (EX90)	
		**************************	
*	A-4378-860-A	MAIN BOARD, COMPLETE	(EX50:AEP, UK, G, IT, CIS)
		***************************************	
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
		< CAPACITOR >	
C301	1-126-961-11	ELECT 2.2uF 20% 50V	
C303	1-162-282-31	CERAMIC 100PF 10% 50V	
C304	1-124-910-11	ELECT 47uF 20% 50V	
C305	1-124-910-11	ELECT 47uF 20% 50V	
C306	1-124-122-11	ELECT 100uF 20% 50V	
C307	1-124-907-11	ELECT 10uF 20% 50V	
C308	1-126-965-11	ELECT 22uF 20% 50V	
C309	1-164-159-11	CERAMIC 0.1uF 50V	
C310	1-136-163-00	FILM 0.068uF 5% 50V	
C311	1-136-163-00	FILM 0.068uF 5% 50V	
C312	1-124-910-11	ELECT 47uF 20% 50V	
C351	1-126-961-11	ELECT 2.2uF 20% 50V	
C353	1-162-282-31	CERAMIC 100PF 10% 50V	
C354	1-124-910-11	ELECT 47uF 20% 50V	
C355	1-124-910-11	ELECT 47uF 20% 50V	
C356	1-124-122-11	ELECT 100uF 20% 50V	
C357	1-124-907-11	ELECT 10uF 20% 50V	
C360	1-136-163-00	FILM 0.068uF 5% 50V	
C361	1-136-163-00	FILM 0.068uF 5% 50V	
C401	1-136-165-00	FILM 0.1uF 5% 50V	(EX50:AEP, UK, G, IT, CIS/EX90)
C402	1-136-165-00	FILM 0.1uF 5% 50V	(EX50:AEP, UK, G, IT, CIS/EX90)
C451	1-136-165-00	FILM 0.1uF 5% 50V	(EX50:AEP, UK, G, IT, CIS/EX90)
C452	1-136-165-00	FILM 0.1uF 5% 50V	(EX50:AEP, UK, G, IT, CIS/EX90)
C510	1-162-282-31	CERAMIC 100PF 10% 50V	
C531	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C532	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C533	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C534	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C560	1-162-282-31	CERAMIC 100PF 10% 50V	
C601	1-162-294-31	CERAMIC 0.001uF 10% 50V	(EX50:E, EA, HK, MY, SP, TH)
C602	1-162-306-11	CERAMIC 0.01uF 30% 16V	(EX50:E, EA, HK, MY, SP, TH)
C603	1-162-282-31	CERAMIC 100PF 10% 50V	(EX50:E, EA, HK, MY, SP, TH)
C604	1-162-215-31	CERAMIC 47PF 5% 50V	(EX50:E, EA, HK, MY, SP, TH)
C605	1-104-664-11	ELECT 47uF 20% 16V	
C606	1-124-907-11	ELECT 10uF 20% 50V	
C651	1-162-294-31	CERAMIC 0.001uF 10% 50V	(EX50:E, EA, HK, MY, SP, TH)
C652	1-162-306-11	CERAMIC 0.01uF 30% 16V	(EX50:E, EA, HK, MY, SP, TH)
C653	1-162-282-31	CERAMIC 100PF 10% 50V	(EX50:E, EA, HK, MY, SP, TH)
C654	1-162-215-31	CERAMIC 47PF 5% 50V	(EX50:E, EA, HK, MY, SP, TH)
C655	1-104-664-11	ELECT 47uF 20% 16V	
C656	1-124-907-11	ELECT 10uF 20% 50V	
C701	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C702	1-124-443-00	ELECT 100uF 20% 10V	
C703	1-126-961-11	ELECT 2.2uF 20% 50V	
C704	1-124-443-00	ELECT 100uF 20% 10V	
C711	1-126-965-11	ELECT 22uF 20% 50V	
C712	1-126-965-11	ELECT 22uF 20% 50V	
C761	1-126-965-11	ELECT 22uF 20% 50V	
C762	1-126-965-11	ELECT 22uF 20% 50V	
C804	1-136-165-00	FILM 0.1uF 5% 50V	
C805	1-126-138-11	ELECT 4700uF 20% 50V	
C807	1-126-968-11	ELECT 100uF 20% 35V	
C808	1-124-443-00	ELECT 100uF 20% 10V	
C809	1-124-472-11	ELECT 470uF 20% 10V	
C814	1-136-165-00	FILM 0.1uF 5% 50V	
C815	1-126-138-11	ELECT 4700uF 20% 50V	
C817	1-126-968-11	ELECT 100uF 20% 35V	
C818	1-124-443-00	ELECT 100uF 20% 10V	
C819	1-124-472-11	ELECT 470uF 20% 10V	

MAIN

Ref. No.	Part No.	Description	Remark
C821	1-136-153-00	FILM 0.01uF 5% 50V	
C822	1-126-952-11	ELECT 1000uF 20% 16V	
C824	1-124-472-11	ELECT 470uF 20% 10V	
C831	1-136-153-00	FILM 0.01uF 5% 50V	
C1001	1-124-907-11	ELECT 10uF 20% 50V	(EX90)
C1003	1-126-096-11	ELECT 10uF 20% 35V	(EX90)
C1004	1-126-096-11	ELECT 10uF 20% 35V	(EX90)
		< CONNECTOR >	
CN11	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)	
CN501	1-770-966-11	PIN, CONNECTOR (PCB)(V TYPE)6P	
* CN801	1-568-839-11	SOCKET, CONNECTOR 23P	
CN1001	1-564-506-11	PLUG, CONNECTOR 3P	(EX90)
		< DIODE >	
D301	8-719-987-63	DIODE 1N4148M	
D302	8-719-987-63	DIODE 1N4148M	
D351	8-719-987-63	DIODE 1N4148M	
D352	8-719-987-63	DIODE 1N4148M	
D702	8-719-987-63	DIODE 1N4148M	
D801	8-719-987-63	DIODE 1N4148M	(EX90)
D803	8-719-987-63	DIODE 1N4148M	
D804	8-719-510-68	DIODE D5SBA20F01	
D808	8-719-024-99	DIODE 11ES2-NTA2B	
D809	8-719-933-54	DIODE HZS9A2L	
D813	8-719-987-63	DIODE 1N4148M	
D818	8-719-024-99	DIODE 11ES2-NTA2B	
D819	8-719-933-54	DIODE HZS9A2L	
D1001	8-719-987-63	DIODE 1N4148M	(EX90)
D1002	8-719-987-63	DIODE 1N4148M	(EX90)
D1051	8-719-987-63	DIODE 1N4148M	(EX90)
		< IC >	
IC301	8-749-900-24	IC STK-4162MK2	(EX50)
IC301	8-749-920-10	IC STK4172MK2	(EX90)
IC501	8-759-000-47	IC MC14051BCP	
IC502	8-759-000-47	IC MC14051BCP	
IC503	8-759-000-48	IC MC14052BCP	
IC504	8-759-000-49	IC MC14066BCP	(EX50:E, EA, HK, MY, SP, TH)
IC601	8-759-710-59	IC NJM4580D-D	
IC701	8-759-111-68	IC UPC1237HA	
IC802	8-759-231-53	IC TA7805S	
IC1001	8-759-377-68	IC TA78L007AP-TPE6	(EX90)
		< JACK >	
J501	1-770-015-11	JACK, PIN 6P(TUNER IN, CD IN, MD/DAT OUT)	
J502	1-770-015-11	JACK, PIN 6P(MD/DAT IN, TAPE OUT, TAPE IN)	
J503	1-770-015-11	JACK, PIN 6P (VIDEO2/AUX IN, VIDEO1 OUT, VIDEO1 IN)	

Ref. No.	Part No.	Description	Remark
		< COIL >	
L301	1-420-872-00	COIL, AIR-CORE	(EX50:AEP, UK, G, IT, CIS/EX90)
L351	1-420-872-00	COIL, AIR-CORE	(EX50:AEP, UK, G, IT, CIS/EX90)
		< TRANSISTOR >	
Q301	8-729-140-82	TRANSISTOR 2SA988-PAFAEA	
Q302	8-729-900-36	TRANSISTOR DTC124ES	
Q303	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q351	8-729-140-82	TRANSISTOR 2SA988-PAFAEA	
Q801	8-729-119-78	TRANSISTOR 2SC2785-HFE	(EX90)
Q809	8-729-140-96	TRANSISTOR 2SD774-34	
Q819	8-729-140-97	TRANSISTOR 2SB734-34	
Q1001	8-729-119-78	TRANSISTOR 2SC2785-HFE	(EX90)
Q1002	8-729-118-00	TRANSISTOR 2SB1116-L	(EX90)
Q1003	8-729-119-78	TRANSISTOR 2SC2785-HFE	(EX90)
		< RESISTOR >	
R301	1-249-417-11	CARBON 1K 5% 1/4W	
R302	1-249-438-11	CARBON 56K 5% 1/4W	
R303	1-249-415-11	CARBON 680 5% 1/4W	
R304	1-249-438-11	CARBON 56K 5% 1/4W	
R305	1-260-103-11	CARBON 2.2K 5% 1/2W	
R306	1-260-103-11	CARBON 2.2K 5% 1/2W	
⚠R309	1-212-881-11	FUSIBLE 100 5% 1/4W	F
⚠R310	1-217-151-00	METAL PLATE 0.22 10% 2W	F
R311	1-249-417-11	CARBON 1K 5% 1/4W	
R312	1-249-431-11	CARBON 15K 5% 1/4W	
R314	1-260-099-11	CARBON 1K 5% 1/2W	
R316	1-260-099-11	CARBON 1K 5% 1/2W	
R318	1-260-076-11	CARBON 10 5% 1/2W	
R320	1-260-076-11	CARBON 10 5% 1/2W	(EX50:AEP, UK, G, IT, CIS/EX90)
R322	1-249-429-11	CARBON 10K 5% 1/4W	
R323	1-247-881-00	CARBON 120K 5% 1/4W	
R324	1-249-437-11	CARBON 47K 5% 1/4W	
R325	1-249-417-11	CARBON 1K 5% 1/4W	
R326	1-249-439-11	CARBON 68K 5% 1/4W	
R327	1-249-437-11	CARBON 47K 5% 1/4W	
R328	1-249-426-11	CARBON 5.6K 5% 1/4W	
R329	1-249-433-11	CARBON 22K 5% 1/4W	
⚠R330	1-212-849-00	FUSIBLE 4.7 5% 1/4W	F
R351	1-249-417-11	CARBON 1K 5% 1/4W	
R352	1-249-438-11	CARBON 56K 5% 1/4W	
R353	1-249-415-11	CARBON 680 5% 1/4W	
R354	1-249-438-11	CARBON 56K 5% 1/4W	
R355	1-260-103-11	CARBON 2.2K 5% 1/2W	
R356	1-260-103-11	CARBON 2.2K 5% 1/2W	
⚠R359	1-212-881-11	FUSIBLE 100 5% 1/4W	F

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
⚠R360	1-217-151-00	METAL PLATE	0.22	10%	2W	F
R361	1-249-417-11	CARBON	1K	5%	1/4W	
R362	1-249-431-11	CARBON	15K	5%	1/4W	
R368	1-260-076-11	CARBON	10	5%	1/2W	
R370	1-260-076-11	CARBON	10	5%	1/2W	
						(EX50:AEP, UK, G, IT, CIS/EX90)
R401	1-260-076-11	CARBON	10	5%	1/2W	
						(EX50:AEP, UK, G, IT, CIS/EX90)
R451	1-260-076-11	CARBON	10	5%	1/2W	
						(EX50:AEP, UK, G, IT, CIS/EX90)
R501	1-249-417-11	CARBON	1K	5%	1/4W	
R502	1-249-425-11	CARBON	4.7K	5%	1/4W	
R503	1-249-417-11	CARBON	1K	5%	1/4W	
R504	1-249-425-11	CARBON	4.7K	5%	1/4W	
R505	1-249-417-11	CARBON	1K	5%	1/4W	
R506	1-249-417-11	CARBON	1K	5%	1/4W	
R507	1-249-417-11	CARBON	1K	5%	1/4W	
R508	1-249-417-11	CARBON	1K	5%	1/4W	
R509	1-249-417-11	CARBON	1K	5%	1/4W	
R512	1-249-429-11	CARBON	10K	5%	1/4W	
R514	1-249-429-11	CARBON	10K	5%	1/4W	
R521	1-249-417-11	CARBON	1K	5%	1/4W	
R522	1-249-417-11	CARBON	1K	5%	1/4W	
R523	1-249-417-11	CARBON	1K	5%	1/4W	
R531	1-249-429-11	CARBON	10K	5%	1/4W	
R532	1-249-429-11	CARBON	10K	5%	1/4W	
R533	1-249-429-11	CARBON	10K	5%	1/4W	
R534	1-247-807-31	CARBON	100	5%	1/4W	
R535	1-247-807-31	CARBON	100	5%	1/4W	
R536	1-247-807-31	CARBON	100	5%	1/4W	
R551	1-249-417-11	CARBON	1K	5%	1/4W	
R552	1-249-425-11	CARBON	4.7K	5%	1/4W	
R553	1-249-417-11	CARBON	1K	5%	1/4W	
R554	1-249-425-11	CARBON	4.7K	5%	1/4W	
R555	1-249-417-11	CARBON	1K	5%	1/4W	
R556	1-249-417-11	CARBON	1K	5%	1/4W	
R557	1-249-417-11	CARBON	1K	5%	1/4W	
R558	1-249-417-11	CARBON	1K	5%	1/4W	
R559	1-249-417-11	CARBON	1K	5%	1/4W	
R562	1-249-429-11	CARBON	10K	5%	1/4W	
R564	1-249-429-11	CARBON	10K	5%	1/4W	
R571	1-249-417-11	CARBON	1K	5%	1/4W	
R572	1-249-417-11	CARBON	1K	5%	1/4W	
R573	1-249-417-11	CARBON	1K	5%	1/4W	
R601	1-249-437-11	CARBON	47K	5%	1/4W	
						(EX50:E, EA, HK, MY, SP, TH)
R602	1-249-437-11	CARBON	47K	5%	1/4W	
						(EX50:AEP, UK, G, IT, CIS/EX90)
R602	1-249-434-11	CARBON	27K	5%	1/4W	
						(EX50:E, EA, HK, MY, SP, TH)
R603	1-249-437-11	CARBON	47K	5%	1/4W	
R604	1-249-437-11	CARBON	47K	5%	1/4W	
R605	1-249-437-11	CARBON	47K	5%	1/4W	
						(EX50:E, EA, HK, MY, SP, TH)
R606	1-249-441-11	CARBON	100K	5%	1/4W	
R607	1-249-441-11	CARBON	100K	5%	1/4W	
R651	1-249-437-11	CARBON	47K	5%	1/4W	
						(EX50:E, EA, HK, MY, SP, TH)
R652	1-249-437-11	CARBON	47K	5%	1/4W	
						(EX50:AEP, UK, G, IT, CIS/EX90)
R652	1-249-434-11	CARBON	27K	5%	1/4W	
						(EX50:E, EA, HK, MY, SP, TH)
R653	1-249-437-11	CARBON	47K	5%	1/4W	
R654	1-249-437-11	CARBON	47K	5%	1/4W	
R655	1-249-437-11	CARBON	47K	5%	1/4W	
						(EX50:E, EA, HK, MY, SP, TH)
R656	1-249-441-11	CARBON	100K	5%	1/4W	
R701	1-249-429-11	CARBON	10K	5%	1/4W	
R702	1-249-441-11	CARBON	100K	5%	1/4W	
R703	1-249-430-11	CARBON	12K	5%	1/4W	
R704	1-249-437-11	CARBON	47K	5%	1/4W	
⚠R705	1-215-890-11	METAL OXIDE	470	5%	2W	F
R706	1-249-438-11	CARBON	56K	5%	1/4W	
R707	1-249-437-11	CARBON	47K	5%	1/4W	
R711	1-260-095-11	CARBON	470	5%	1/2W	
R713	1-249-441-11	CARBON	100K	5%	1/4W	
R761	1-260-095-11	CARBON	470	5%	1/2W	
R763	1-249-441-11	CARBON	100K	5%	1/4W	
R803	1-249-429-11	CARBON	10K	5%	1/4W	
R804	1-249-417-11	CARBON	1K	5%	1/4W	(EX90)
R805	1-260-103-11	CARBON	2.2K	5%	1/2W	
R807	1-260-103-11	CARBON	2.2K	5%	1/2W	
R809	1-249-421-11	CARBON	2.2K	5%	1/4W	
R813	1-249-429-11	CARBON	10K	5%	1/4W	
R815	1-260-103-11	CARBON	2.2K	5%	1/2W	
R817	1-260-103-11	CARBON	2.2K	5%	1/2W	
R819	1-249-421-11	CARBON	2.2K	5%	1/4W	
R1001	1-249-433-11	CARBON	22K	5%	1/4W	(EX90)
R1002	1-249-441-11	CARBON	100K	5%	1/4W	(EX90)
R1003	1-249-441-11	CARBON	100K	5%	1/4W	(EX90)
R1004	1-249-429-11	CARBON	10K	5%	1/4W	(EX90)
R1006	1-249-441-11	CARBON	100K	5%	1/4W	(EX90)
R1007	1-249-441-11	CARBON	100K	5%	1/4W	(EX90)
R1051	1-249-433-11	CARBON	22K	5%	1/4W	(EX90)

< RELAY >

RY701	1-515-920-11	RELAY (24V)

< TERMINAL >

TB401	1-537-240-11	TERMINAL BOARD (CHECKER PIN) (SPEAKER)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MAIN PANEL

Consisting the following section
in the panel. (HP, MIC, VOL)

Ref. No.	Part No.	Description	Remark
		< THERMISTOR >	
TH1001	1-807-796-11	THERMISTOR (EX90)	
**			
*	A-4378-852-A	PANEL BOARD, COMPLETE	(EX50:E, EA, HK, MY, SP, TH)
		***************************************	
*	A-4378-855-A	PANEL BOARD, COMPLETE (EX90)	
		****************************	
*	A-4378-859-A	PANEL BOARD, COMPLETE	(EX50:AEP, UK, G, IT, CIS)
		***************************************	
			(Including HP, MIC, VOL BOARD)
	1-690-880-11	LEAD (WITH CONNECTOR)	
		< CAPACITOR >	
C100	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C101	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C102	1-124-907-11	ELECT 10uF 20% 50V	
C104	1-164-159-11	CERAMIC 0.1uF 50V	
C106	1-126-968-11	ELECT 100uF 20% 6.3V	
C107	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C111	1-126-968-11	ELECT 100uF 20% 6.3V	
C112	1-164-159-11	CERAMIC 0.1uF 50V	
C113	1-162-282-31	CERAMIC 100PF 10% 50V	
C204	1-124-257-00	ELECT 2.2uF 20% 50V	
C205	1-126-963-11	ELECT 4.7uF 20% 50V	
C206	1-162-282-31	CERAMIC 100PF 10% 50V	
C207	1-162-217-31	CERAMIC 56PF 5% 50V	
C208	1-126-963-11	ELECT 4.7uF 20% 50V	
C209	1-136-157-00	FILM 0.022uF 5% 50V	
C210	1-136-163-00	FILM 0.068uF 5% 50V	
C211	1-136-167-00	FILM 0.15uF 5% 50V	
C212	1-136-173-00	FILM 0.47uF 5% 50V	
C213	1-126-963-11	ELECT 4.7uF 20% 50V	
C221	1-164-159-11	CERAMIC 0.1uF 50V	(EX50:E, EA, HK, MY, SP, TH)
C223	1-162-282-31	CERAMIC 100PF 10% 50V	(EX50:E, EA, HK, MY, SP, TH)
C224	1-162-286-31	CERAMIC 220PF 10% 50V	(EX50:E, EA, HK, MY, SP, TH)
C225	1-164-159-11	CERAMIC 0.1uF 50V	(EX50:E, EA, HK, MY, SP, TH)
C226	1-164-159-11	CERAMIC 0.1uF 50V	(EX50:E, EA, HK, MY, SP, TH)
C227	1-162-282-31	CERAMIC 100PF 10% 50V	(EX50:E, EA, HK, MY, SP, TH)
C228	1-162-286-31	CERAMIC 220PF 10% 50V	(EX50:E, EA, HK, MY, SP, TH)
C229	1-124-464-11	ELECT 0.22uF 20% 50V	(EX50:E, EA, HK, MY, SP, TH)
C230	1-104-663-11	ELECT 33uF 20% 16V	(EX50:E, EA, HK, MY, SP, TH)
C231	1-104-663-11	ELECT 33uF 20% 16V	(EX50:E, EA, HK, MY, SP, TH)
C232	1-162-286-31	CERAMIC 220PF 10% 50V	(EX50:AEP, UK, G, IT, CIS/EX90)
C233	1-162-286-31	CERAMIC 220PF 10% 50V	(EX50:AEP, UK, G, IT, CIS/EX90)
C240	1-164-159-11	CERAMIC 0.1uF 50V	
C255	1-126-963-11	ELECT 4.7uF 20% 50V	
C256	1-162-282-31	CERAMIC 100PF 10% 50V	
C257	1-162-217-31	CERAMIC 56PF 5% 50V	
C258	1-126-963-11	ELECT 4.7uF 20% 50V	
C259	1-136-157-00	FILM 0.022uF 5% 50V	
C260	1-136-163-00	FILM 0.068uF 5% 50V	
C261	1-136-167-00	FILM 0.15uF 5% 50V	
C262	1-136-173-00	FILM 0.47uF 5% 50V	
C263	1-126-963-11	ELECT 4.7uF 20% 50V	
		< CONNECTOR >	
* CN101	1-568-839-11	SOCKET, CONNECTOR 23P	
CN201	1-764-341-11	PIN, CONNECTOR (PCB) (L TYPE) 4P	
		< DIODE >	
D101	8-719-046-44	DIODE SEL5221S (TUNER)	
D102	8-719-046-44	DIODE SEL5221S (CD)	
D103	8-719-046-44	DIODE SEL5221S (MD)	
D104	8-719-046-44	DIODE SEL5221S (TAPE)	
D105	8-719-046-44	DIODE SEL5221S (VIDEO2/AUX)	
D106	8-719-046-44	DIODE SEL5221S (VIDEO1)	
D107	8-719-046-44	DIODE SEL5221S (SOURCE DIRECT)	
D108	8-719-046-44	DIODE SEL5221S (-20dB MUTING)	
D109	8-719-987-63	DIODE 1N4148M	
D110	8-719-987-63	DIODE 1N4148M	
D111	8-719-987-63	DIODE 1N4148M	
D112	8-719-987-63	DIODE 1N4148M	
D113	8-719-046-44	DIODE SEL5221S (KARAOKE PON)	(EX50:E, EA, HK, MY, SP, TH)
D114	8-719-046-44	DIODE SEL5221S (ON/STANDBY)	
		< IC >	
IC101	8-759-386-85	IC M37471M2-S1	
IC102	8-749-923-11	IC GP1U58XB (🅁)	
IC103	8-759-165-80	IC PST600C-T	
IC104	8-759-962-08	IC BA6208	
IC201	8-759-634-51	IC M5218AP	
IC202	8-759-000-48	IC MC14052BCP	
IC221	8-759-634-51	IC M5218AP (EX50:E, EA, HK, MY, SP, TH)	

Ref. No.	Part No.	Description	Remark
		< JACK >	
J201	1-507-854-00	JACK, PHONE (MIX MIC)	(EX50:E, EA, HK, MY, SP, TH)
J202	1-507-854-00	JACK, PHONE (PHONES)	
		< TRANSISTOR >	
Q101	8-729-900-63	TRANSISTOR DTA124ES	
Q102	8-729-900-36	TRANSISTOR DTC124ES	
Q103	8-729-900-36	TRANSISTOR DTC124ES	
Q104	8-729-900-36	TRANSISTOR DTC124ES	
Q105	8-729-900-36	TRANSISTOR DTC124ES	
Q106	8-729-900-36	TRANSISTOR DTC124ES	
Q107	8-729-900-36	TRANSISTOR DTC124ES	
Q108	8-729-900-36	TRANSISTOR DTC124ES	
Q109	8-729-900-36	TRANSISTOR DTC124ES	
Q110	8-729-900-36	TRANSISTOR DTC124ES	
Q111	8-729-900-63	TRANSISTOR DTA124ES	
Q112	8-729-900-36	TRANSISTOR DTC124ES	
Q113	8-729-900-36	TRANSISTOR DTC124ES	
Q114	8-729-900-36	TRANSISTOR DTC124ES	
Q115	8-729-900-36	TRANSISTOR DTC124ES	(EX50:E, EA, HK, MY, SP, TH)
Q116	8-729-900-63	TRANSISTOR DTA124ES	(EX50:E, EA, HK, MY, SP, TH)
Q117	8-729-900-36	TRANSISTOR DTC124ES	
Q118	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q201	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q251	8-729-141-30	TRANSISTOR 2SC3623A-LK	
		< RESISTOR >	
R1	1-249-429-11	CARBON 10K 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R2	1-249-429-11	CARBON 10K 5% 1/4W	(EX50:AEP, UK, G, IT, CIS/EX90)
R100	1-249-429-11	CARBON 10K 5% 1/4W	
R101	1-249-431-11	CARBON 15K 5% 1/4W	
R102	1-249-417-11	CARBON 1K 5% 1/4W	
R103	1-249-418-11	CARBON 1.2K 5% 1/4W	
R104	1-249-418-11	CARBON 1.2K 5% 1/4W	
R105	1-249-419-11	CARBON 1.5K 5% 1/4W	
R106	1-249-427-11	CARBON 6.8K 5% 1/4W	
R107	1-249-423-11	CARBON 3.3K 5% 1/4W	
R108	1-249-429-11	CARBON 10K 5% 1/4W	
R109	1-249-428-11	CARBON 8.2K 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R110	1-249-409-11	CARBON 220 5% 1/4W	
R111	1-249-409-11	CARBON 220 5% 1/4W	
R112	1-249-429-11	CARBON 10K 5% 1/4W	
R113	1-249-417-11	CARBON 1K 5% 1/4W	
R114	1-249-429-11	CARBON 10K 5% 1/4W	
R115	1-249-429-11	CARBON 10K 5% 1/4W	

Ref. No.	Part No.	Description	Remark
R116	1-249-393-11	CARBON 10 5% 1/4W	
R117	1-249-437-11	CARBON 47K 5% 1/4W	
R119	1-249-409-11	CARBON 220 5% 1/4W	
R120	1-249-409-11	CARBON 220 5% 1/4W	
R126	1-249-409-11	CARBON 220 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R127	1-247-807-31	CARBON 100 5% 1/4W	
R130	1-249-441-11	CARBON 100K 5% 1/4W	
R131	1-249-425-11	CARBON 4.7K 5% 1/4W	
R132	1-249-425-11	CARBON 4.7K 5% 1/4W	
R133	1-249-385-11	CARBON 2.2 5% 1/6W	
R134	1-247-807-31	CARBON 100 5% 1/4W	
R200	1-249-429-11	CARBON 10K 5% 1/4W	
R201	1-249-421-11	CARBON 2.2K 5% 1/4W	
R202	1-249-409-11	CARBON 220 5% 1/4W	
R203	1-249-429-11	CARBON 10K 5% 1/4W	
R204	1-249-417-11	CARBON 1K 5% 1/4W	
R205	1-249-441-11	CARBON 100K 5% 1/4W	
R206	1-249-417-11	CARBON 1K 5% 1/4W	
R207	1-247-903-00	CARBON 1M 5% 1/4W	
R208	1-249-422-11	CARBON 2.7K 5% 1/4W	
R209	1-249-429-11	CARBON 10K 5% 1/4W	
R210	1-249-411-11	CARBON 330 5% 1/4W	
R212	1-249-409-11	CARBON 220 5% 1/4W	
R213	1-247-903-00	CARBON 1M 5% 1/4W	
R214	1-247-903-00	CARBON 1M 5% 1/4W	
R215	1-249-423-11	CARBON 3.3K 5% 1/4W	
R216	1-249-417-11	CARBON 1K 5% 1/4W	
R219	1-247-903-00	CARBON 1M 5% 1/4W	
R220	1-247-807-31	CARBON 100 5% 1/4W	
R221	1-249-441-11	CARBON 100K 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R222	1-249-417-11	CARBON 1K 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R223	1-249-431-11	CARBON 15K 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R224	1-249-441-11	CARBON 100K 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R225	1-249-417-11	CARBON 1K 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R226	1-249-435-11	CARBON 33K 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R227	1-249-441-11	CARBON 100K 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R228	1-249-441-11	CARBON 100K 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R229	1-249-417-11	CARBON 1K 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R230	1-249-409-11	CARBON 220 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)
R231	1-249-409-11	CARBON 220 5% 1/4W	(EX50:E, EA, HK, MY, SP, TH)

PANEL PRIMARY SECONDARY

Ref. No.	Part No.	Description	Remark
R251	1-249-421-11	CARBON 2.2K 5% 1/4W	
R252	1-249-409-11	CARBON 220 5% 1/4W	
R253	1-249-429-11	CARBON 10K 5% 1/4W	
R255	1-249-429-11	CARBON 10K 5% 1/4W	
R256	1-249-417-11	CARBON 1K 5% 1/4W	
R257	1-247-903-00	CARBON 1M 5% 1/4W	
R258	1-249-422-11	CARBON 2.7K 5% 1/4W	
R259	1-249-429-11	CARBON 10K 5% 1/4W	
R260	1-249-411-11	CARBON 330 5% 1/4W	
R262	1-249-409-11	CARBON 220 5% 1/4W	
R263	1-247-903-00	CARBON 1M 5% 1/4W	
R264	1-247-903-00	CARBON 1M 5% 1/4W	
R265	1-249-423-11	CARBON 3.3K 5% 1/4W	
R266	1-249-417-11	CARBON 1K 5% 1/4W	
R269	1-247-903-00	CARBON 1M 5% 1/4W	
R270	1-247-807-31	CARBON 100 5% 1/4W	
		< VARIABLE RESISTOR >	
RV201	1-223-973-11	RES, VAR, CARBON 10K/10K (TREBLE)	
RV202	1-223-973-11	RES, VAR, CARBON 10K/10K (BASS)	
RV204	1-223-811-11	RES, VAR, CARBON 100K/100K (VOLUME)	
RV221	1-223-974-11	RES, VAR, CARBON 50K (MIC LEVEL)	(EX50:E, EA, HK, MY, SP, TH)
		< SWITCH >	
S101	1-554-303-21	SWITCH, TACTILE (SYSTEM POWER)	
S102	1-554-303-21	SWITCH, TACTILE (TUNER)	
S103	1-554-303-21	SWITCH, TACTILE (CD)	
S104	1-554-303-21	SWITCH, TACTILE (MD)	
S105	1-554-303-21	SWITCH, TACTILE (TAPE)	
S106	1-554-303-21	SWITCH, TACTILE (VIDEO2/AUX)	
S107	1-554-303-21	SWITCH, TACTILE (VIDEO1)	
S108	1-554-303-21	SWITCH, TACTILE (-20dB MUTING)	
S109	1-554-303-21	SWITCH, TACTILE (SOURCE DIRECT)	
S110	1-554-303-21	SWITCH, TACTILE (KARAOKE PON)	(EX50:E, EA, HK, MY, SP, TH)
		< VIBRATOR >	
X101	1-579-125-11	VIBRATOR, CERAMIC (8MHz)	

****

Ref. No.	Part No.	Description	Remark
*	1-659-591-11	PRIMARY BOARD (EX50:AEP, UK, G, IT, CIS, TH) ***************************************	
*	1-659-592-11	PRIMARY BOARD (EX50:E, EA, HK, MY, SP/EX90) ***************************************	
	1-533-217-31	HOLDER, FUSE	
		< CAPACITOR >	
⚠C991	1-113-925-51	ELECT 0.01uF 20% 250V	(EX90)

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
CN900	1-564-321-00	PIN, CONNECTOR 2P	(EX50:E, EA, HK, MY, SP/EX90)
CN911	1-564-321-00	PIN, CONNECTOR 2P	(EX50:AEP, UK, G, IT, CIS, TH)
CN991	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P	(EX90)
CN992	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P	(EX90)
CN993	1-764-325-11	PIN, CONNECTOR (PCB)(V TYPE) 2P	(EX90)
		< FUSE >	
⚠F901	1-532-078-00	FUSE, TIME LAG (T1.0AL 250V)	(EX50:E, EA, HK, MY, SP)
⚠F901	1-532-285-00	FUSE, TIME LAG (T1.25AL 250V)	(EX90)
⚠F902	1-532-286-00	FUSE, TIME LAG (T2.5AL 250V)	(EX50:E, EA, HK, MY, SP)
⚠F911	1-532-078-00	FUSE, TIME LAG (T1.0AL 250V)	(EX50:TH)
⚠F911	1-532-285-00	FUSE, TIME LAG (T1.25AL 250V)	(EX50:AEP, UK, G, IT, CIS)
⚠F991	1-532-286-00	FUSE, TIME LAG (T2.5AL 250V)	(EX90)
		< RELAY >	
⚠RY991	1-755-018-11	RELAY	(EX90)
		< SWITCH >	
S901	1-572-675-11	SWITCH, POWER VOLTAGE CHANGE (VOLTAGE SELECTOR)	(EX50:E, EA, HK, MY, SP)

****

Ref. No.	Part No.	Description	Remark
*	1-659-593-11	SECONDARY BOARD ***************	
	1-533-217-31	HOLDER, FUSE	
		< CONNECTOR >	
CN901	1-770-966-11	PIN, CONNECTOR (PCB)(V TYPE) 6P	
CN902	1-764-326-11	PIN, CONNECTOR (PCB)(V TYPE) 3P	
		< FUSE >	
⚠F903	1-532-286-00	FUSE, TIME LAG (T2.5AL 250V)	
⚠F904	1-532-286-00	FUSE, TIME LAG (T2.5AL 250V)	

****

MISCELLANEOUS
****

Ref. No.	Part No.	Description	Remark
8	1-773-187-11	WIRE (FLAT TYPE)(23 CORE)	
⚠51	1-569-007-11	ADAPTER, CONVERSION 2P	(EX50:E)
⚠51	1-569-008-11	ADAPTER, CONVERSION 2P	(EX50:EA, MY, SP)
⚠51	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P	(EX50:HK)
58	1-776-429-11	CORD (WITH CONNECTOR)	(EX90)

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
⚠CN994	1-526-794-11	OUTLET, AC (AC OUTLET)(EX90)	
⚠CN995	1-526-794-11	OUTLET, AC (AC OUTLET)(EX90)	
⚠CNP901	1-575-651-11	CORD, POWER (EX50:AEP, G, IT, CIS, EA, MY, SP, HK/EX90:AEP, IT)	
⚠CNP901	1-575-653-11	CORD, POWER (EX50:E)	
⚠CNP901	1-751-326-31	CORD, POWER (EX50:TH)	
⚠CNP901	1-751-520-21	CORD, POWER (EX50:UK/EX90:UK)	
⚠F901	1-532-078-00	FUSE, TIME LAG (T1.0AL, 250V) (EX50:E, EA, MY, SP, HK, TH)	
⚠F901	1-532-285-00	FUSE, TIME LAG (T1.25AL, 250V)(EX90)	
⚠F902	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V) (EX50:E, EA, MY, SP, HK)	
⚠F903	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V)	
⚠F904	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V)	
⚠F911	1-532-078-00	FUSE, TIME LAG (T1.0AL, 250V)(EX50:TH)	
⚠F911	1-532-285-00	FUSE, TIME LAG (T1.25AL, 250V) (EX50:AEP, UK, G, IT, CIS)	
⚠F991	1-532-286-00	FUSE, TIME LAG (T2.5AL, 250V)(EX90)	
⚠M1001	1-698-720-11	MOTOR, FAN (DC)(EX90)	
RV204	1-223-811-11	RES, VAR, CARBON 100K/100K (VOLUME)	
⚠T901	1-429-311-11	TRANSFORMER, POWER (EX50:E, EA, MY, SP, HK, TH)	
⚠T901	1-429-312-11	TRANSFORMER, POWER(EX90)	
⚠T901	1-429-484-11	TRANSFORMER, POWER(EX50:AEP, UK, G, IT, CIS)	

****

ACCESSORIES & PACKING MATERIALS

****

*	4-980-537-01	CUSHION (UPPER)
*	4-980-538-01	CUSHION (LOWER)

****

****

HARDWARE LIST

****

#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S
#2	7-682-548-04	SCREW +BVTT 3X8 (S)
#3	7-685-650-79	SCREW +BVTP 3X16 TYPE2 IT-3
#4	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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SS-CN12/CN15/CR150/SR12/SR15

SERVICE MANUAL

US Model
Canadian Model
SS-CR150

AEP Model
UK Model
SS-CN15/CR150/SR15

E Model
SS-CN12/CN15/CR150/
SR12/SR15

Australian Model
SS-CN12/SR12

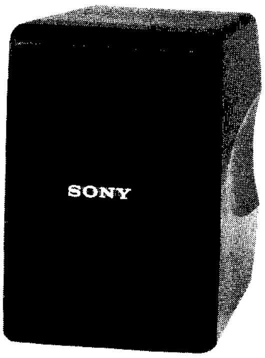


Photo : SS-SR12/SR15

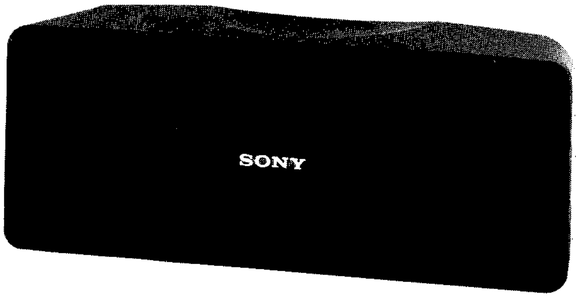


Photo : SS-CN12/CN15

SS-CN12 and SS-SR12 are speaker system in LBT-N600AV.

SS-CR150 is composed for following model.

COMPONENT MODEL NAME FOR THESE SYSTEM

	SS-CR150
Center Speaker	SS-CN15
Surround Speaker	SS-SR15

SPECIFICATIONS

[SS-CN12]

Speaker system
  Full range × 1,magnetically shielded
Speaker unit
  8 cm (3 $^{1}/_{4}$ inches cone type)
Enclosure type
  Bass reflex
Rated impedance
  8 ohms
Power handling capacity
  Maximum input power:70W
Sensitivity
  88 dB (1W, 1m)
Frequency range
  95 - 20,000 Hz
Dimensions
  Approx. 280 × 110 × 140 mm
  (11 $^{1}/_{8}$ × 4 $^{3}/_{8}$ × 5 $^{5}/_{8}$) (w/h/d)
  including front grille
Mass
  Approx. 1.2 kg
Supplied accessory
  Speaker cord 2.5 m (1)
  Foot (4)

[SS-CN15]

Speaker system
  Full range × 2,magnetically shielded
Speaker unit
  8 cm (3 $^{1}/_{4}$ inches cone type)
Enclosure type
  Bass reflex
Rated impedance
  8 ohms
Power handling capacity
  Maximum input power: 120 W
Sensitivity
  89 dB (1W, 1m)
Frequency range
  85 - 20,000 Hz
Dimensions
  Approx. 280 × 110 × 140 mm
  (11 $^{1}/_{8}$ × 4 $^{3}/_{8}$ × 5 $^{5}/_{8}$) (w/h/d)
  including front grille
Mass
  Approx. 1.7 kg
Supplied accessory
  Speaker cord 2.5 m (1)
  Foot (4)

[SS-SR12/SR15]

Speaker system
  Full range
Speaker unit
  8 cm (3 $^{1}/_{4}$ inches cone type)
Enclosure type
  Bass reflex
Rated impedance
  8 ohms
Power handling capacity
  Maximum input power: 70W
Sensitivity
  87 dB (1W, 1m)
Frequency range
  SS-SR12 : 95-20,000Hz
  SS-SR15 : 85-20,000Hz
Dimensions
  Approx. 110 × 160 × 140 mm
  (4 $^{3}/_{8}$ × 6 $^{3}/_{8}$ × 5 $^{5}/_{8}$ inches) (w/h/d)
  including front grille
Mass
  Approx. 740 g / pc
Supplied accessory
  Speaker cord 10 m (2)

Design and specifications are subject to change without notice.

MICROFILM

SPEAKER SYSTEM

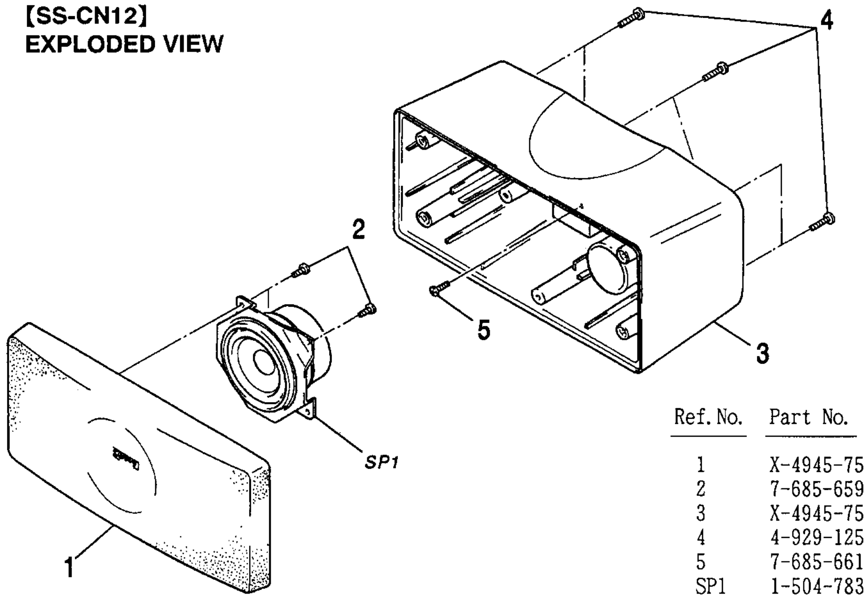
SONY®

[SS-CR150]
PARTS LIST

Ref. No.	Part No.	Description	Remark
	1-769-433-11	CORD, SPEAKER	
	3-798-171-01	MANUAL INSTRUCTION (ENGLISH)	
	4-972-322-01	FOOT (Y)	

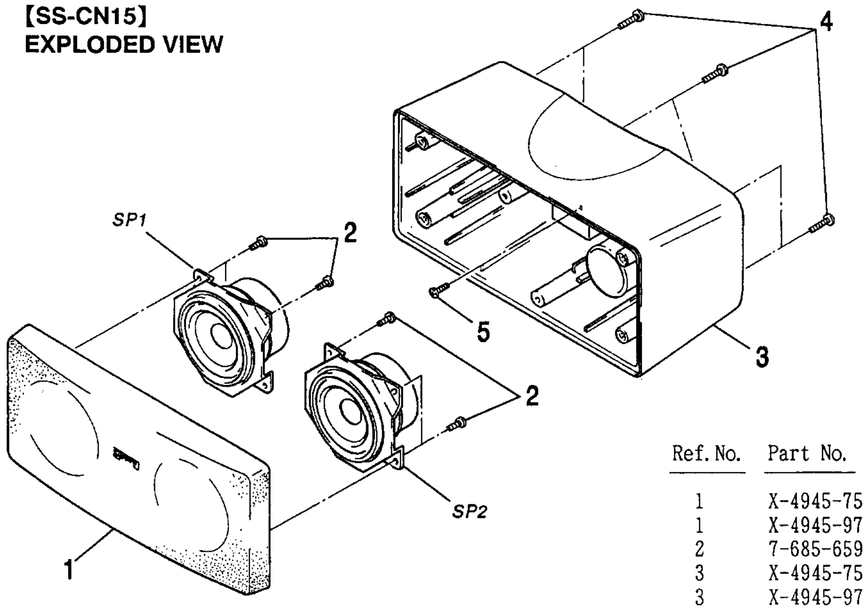
- Items marked " * "are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

[SS-CN12]
EXPLODED VIEW



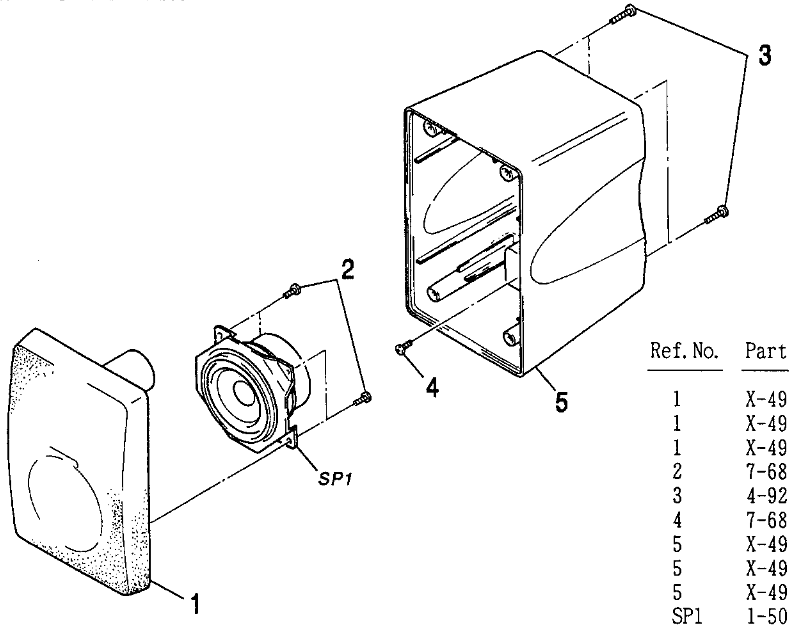
Ref. No.	Part No.	Description	Remark
1	X-4945-758-1	PANEL ASSY, FRONT	
2	7-685-659-79	SCREW +BVTP 4X8, TYPE2	
3	X-4945-757-1	CABINET ASSY, FRONT	
4	4-929-125-01	SCREW (M4X16), TAPPING	
5	7-685-661-79	SCREW +BVTP 4X12, TYPE2	
SP1	1-504-783-11	SPEAKER (8CM)	

[SS-CN15]
EXPLODED VIEW



Ref. No.	Part No.	Description	Remark
1	X-4945-756-1	PANEL ASSY, FRONT (AEP, UK, E)	
1	X-4945-976-1	PANEL ASSY, FRONT (US, Canadian)	
2	7-685-659-79	SCREW +BVTP 4X8, TYPE2	
3	X-4945-757-1	CABINET ASSY, FRONT (AEP, UK, E)	
3	X-4945-977-1	CABINET ASSY, FRONT (US, Canadian)	
4	4-929-125-01	SCREW (M4X16), TAPPING	
5	7-685-661-79	SCREW +BVTP 4X12, TYPE2	
SP1, 2	1-504-782-11	SPEAKER (8CM)	

[SS-SR12/SR15]
EXPLODED VIEW

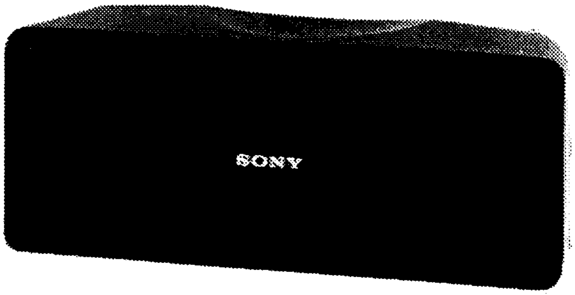


Ref. No.	Part No.	Description	Remark
1	X-4945-746-1	PANEL ASSY, FRONT (SR12) (E, Australian)	
1	X-4945-746-1	PANEL ASSY, FRONT (SR15) (AEP, UK, E)	
1	X-4945-978-1	PANEL ASSY, FRONT (SR15) (US, Canadian)	
2	7-685-659-79	SCREW +BVTP 4X8, TYPE2	
3	4-929-125-01	SCREW (M4X6), TAPPING	
4	7-685-661-79	SCREW +BVTP 4X8, TYPE2	
5	X-4945-747-1	CABINET ASSY, FRONT (SR12) (E, Australian)	
5	X-4945-747-1	CABINET ASSY, FRONT (SR15) (AEP, UK, E)	
5	X-4945-979-1	CABINET ASSY, FRONT (SR15) (US, Canadian)	
SP1	1-504-780-11	SPEAKER (8CM)	

SS-CN14

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model
E Model
Australian Model
Tourist Model



This is a speaker system in
MHC-EX70AV/EX100AV/W77AV.

SPECIFICATIONS

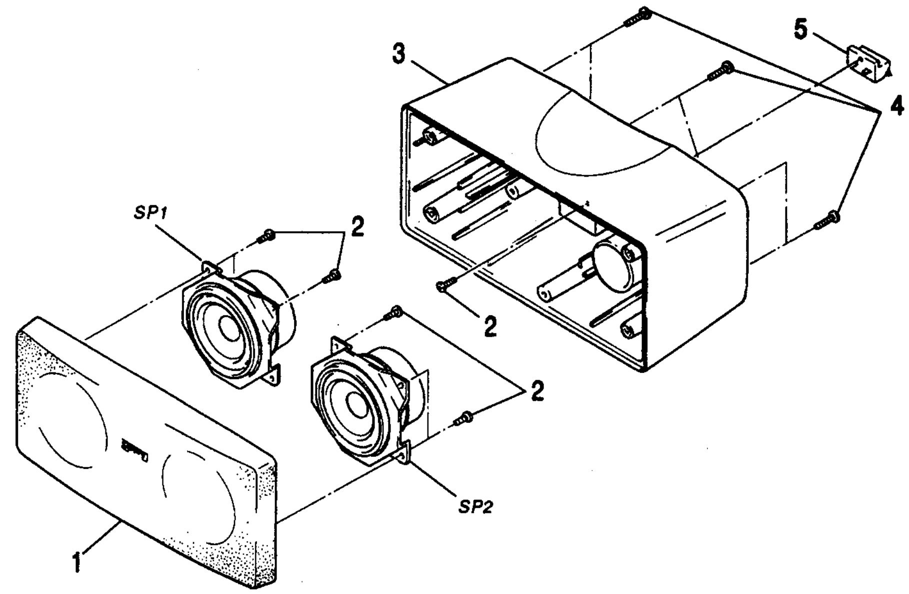
Speaker system
  Full range × 2,magnetically shielded
Speaker unit
  8 cm (3 1/4 inches cone type)
Enclosure type
  Bass reflex
Rated impedance
  8 ohms
Power handling capacity
  Maximum input power: 120 W
Sensitivity
  89 dB (1W, 1m)
Frequency range
  85 - 20,000 Hz
Dimensions
  Approx. 280 × 110 × 140 mm
  (11 1/8 × 4 3/8 × 5 5/8) (w/h/d)
  including front grille
Mass
  Approx. 1.7 kg
Supplied accessory
  Speaker cord 2.5 m (1)
  Foot (4)

MICROFILM

SPEAKER SYSTEM

SONY®

EXPLODED VIEW



Ref. No.	Part No.	Description	Remark
1	X-4947-268-1	PANEL ASSY, FRONT	
2	7-685-659-79	SCREW +BVTP 4X8, TYPE2	
3	X-4945-757-1	CABINET ASSY, FRONT	
4	4-929-125-01	SCREW (M4X16), TAPPING	
5	1-537-775-11	TERMINAL BOARD	
SP1	1-505-313-11	SPEAKER (8CM)	
SP2	1-505-313-11	SPEAKER (8CM)	

9-960-604-11

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Quality Engineering Dept.

MHC-EX50/EX70AV/EX90

SERVICE MANUAL

AEP Model
UK Model
MHC-EX50/EX70AV/EX90

E Model
MHC-EX50/EX70AV

- MHC-EX50/EX70AV/EX90 are composed of following models. As for the service manual, it is issued for each component model, then, please refer to it.

COMPONENTS MODEL NAME FOR MHC-EX50/EX70AV/EX90

	MHC-EX50		MHC-EX70AV		MHC-EX90
	AEP, UK, G, IT, CIS	E, EA, SP, MY, HK, TH	AEP, UK, G, IT	E, EA, SP, MY, HK, TH	AEP, UK, IT
AMPLIFIER	TA-EX50		TA-EX70		TA-EX90
CD PLAYER	CDP-EX100				
TUNER	ST-EX100				
CASSETTE DECK	TC-EX90		TC-EX100	TC-EX90	
FRONT SPEAKER	—	SS-EX55G	—	SS-EX55G	SA-EX100
CENTER SPEAKER	—	—	SS-CN14		—
REAR SPEAKER	—	—	SS-SR12		—

- Abbreviations

G	German	IT	Italian
EA	Saudi Arabia	SP	Singapore
MY	Malaysia	TH	Thailand
HK	Hong Kong		

SPECIFICATIONS

General

Power requirements
  220-230 V AC, 50/60Hz (AEP, UK, G, IT, CIS model)
  220V AC, 50/60Hz (TH model)
  110-120V or 220-240V AC, 50/60Hz
  Adjustable with the voltage selector
  (E, EA, SP, MY, HK model)

Power consumption
  145W (System)
  (EX50 : E, EA, SP, MY, HK, TH model)
  135W (System)
  (EX50 : AEP, UK, G, IT model)
  210W (System) (EX70AV model)
  155W (Active speaker not included) (EX90 model)

Supplied accessories

AM loop aerial (1)
Remote RM-SE5 (1) (EX50/EX90 model)
  RM-SE7AV (1) (EX70AV model)
Sony SUM-3 (NS) batteries (2)
FM lead aerial (1)
Flat cord (1)
Audio cords (4)
Speaker connecting cord
Feet for center speaker (4) (EX70AV model)

Design and specifications are subject to change without notice.

MINI Hi-Fi COMPONENT SYSTEM

SONY®

MICROFILM

PARTS LIST

NOTE :

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- Abbreviations
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  SP : Singapore model
  MY : Malaysia model
  TH : Thailand model
  HK : Hong Kong model

	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
	1-473-591-11	COMMANDER, STANDARD (RM-SE5) (EX50/EX90)	
*	1-473-592-11	COMMANDER, STANDARD (RM-SE7AV) (EX70AV)	
	1-501-659-41	ANTENNA (FM) (E, EA, MY, SP, HK, TH)	
	1-501-721-11	ANTENNA (LOOP)	
	1-501-807-21	ANTENNA (FM) (AEP, UK, G, IT, CIS)	
	1-558-271-11	CORD, CONNECTION (AUDIO 108cm)	
⚠	1-765-293-11	CORD, POWER (SA) (EX90 : AEP, G, IT)	
	1-769-170-11	CORD (WITH CONNECTOR) (7P) (TA-ST-TC-CDP)	
	1-769-307-11	CORD, SPEAKER (TA-SS) (2m) (EX50 : E, EA, SP, MY, HK, TH / EX70AV : E, EA, SP, MY, HK, TH)	
⚠	1-769-312-21	CORD, POWER (SA) (EX90 : UK)	
	1-769-433-11	CORD, SPEAKER (SURROUND) (10m) (EX70AV)	
	1-769-433-21	CORD, SPEAKER (SURROUND) (2.5m) (EX70AV)	
	1-775-512-21	CORD, SPEAKER CONNECTION (TA-SA) (2m) (EX90)	
	3-810-489-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX50 : AEP)	
	3-810-489-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX50 : AEP)	
	3-810-489-31	MANUAL, INSTRUCTION (ENGLISH) (EX50 : UK)	
	3-810-489-41	MANUAL, INSTRUCTION (GERMAN) (EX50 : G)	
	3-810-489-51	MANUAL, INSTRUCTION (ITALIAN) (EX50 : IT)	
	3-810-489-61	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX50 : AEP)	
	3-810-489-71	MANUAL, INSTRUCTION (ENGLISH, RUSSIAN) (EX50 : CIS)	
	3-810-489-81	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE) (EX50 : E, EA, MY, SP, HK,TH)	
	3-810-489-91	MANUAL, INSTRUCTION (ARABIC) (EX50 : EA)	
	3-810-490-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX70AV : AEP)	
	3-810-490-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX70AV : AEP, IT)	
	3-810-490-31	MANUAL, INSTRUCTION (ENGLISH) (EX70AV : UK)	
	3-810-490-41	MANUAL, INSTRUCTION (GERMAN) (EX70AV : G)	
	3-810-490-51	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX70AV : AEP)	
	3-810-490-61	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, CHINESE) (EX70AV : E, EA, MY, SP, HK,TH)	
	3-810-490-71	MANUAL, INSTRUCTION (ARABIC) (EX70AV : EA)	
	3-810-491-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (EX90 : AEP)	
	3-810-491-21	MANUAL, INSTRUCTION (GERMAN, DUTCH, ITALIAN) (EX90 : AEP,IT)	
	3-810-491-31	MANUAL, INSTRUCTION (ENGLISH) (EX90 : UK)	
	3-810-491-41	MANUAL, INSTRUCTION (SWEDISH, DANISH, FINNISH) (EX90 : AEP)	
*	3-933-134-01	CUSHION (LOWER) (TC)	
*	3-933-164-01	CUSHION (UPPER) (TC)	
	4-972-322-01	FOOT (Y) (SURROUND) (EX70AV)	
*	4-972-989-01	CUSHION (SURROUND) (EX70AV)	
*	4-979-172-01	CUSHION (UPPER) (SA) (EX90)	
*	4-979-173-01	CUSHION (LOWER) (SA) (EX90)	
*	4-980-537-01	CUSHION (UPPER) (TA)	
*	4-980-538-01	CUSHION (LOWER) (TA)	
*	4-980-539-01	CUSHION (UPPER) (ST)	
*	4-980-540-01	CUSHION (LOWER) (ST)	
*	4-980-541-01	CUSHION (UPPER) (CD)	
*	4-980-542-01	CUSHION (LOWER) (CD)	
*	4-980-544-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : E, SP, MY, HK)	
*	4-980-545-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : EA)	
*	4-980-546-01	INDIVIDUAL CARTON (TA-TC) (EX70AV : AEP,UK,G,IT)	
*	4-980-548-01	INDIVIDUAL CARTON (TA-TC) (EX50 : AEP,UK,G,IT,CIS)	
*	4-980-549-01	INDIVIDUAL CARTON (TA-TC) (EX90)	
*	4-980-554-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : E, SP, MY, HK)	
*	4-980-555-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : EA)	
	4-980-737-01	LID, BATTERY CASE (for RM-SE5/RM-SE7AV)	
*	4-980-788-01	CUSHION (EX) (SS) (EX50 : E,EA,SP,MY, HK,TH/EX70AV : E,EA,SP,MY,HK,TH)	
*	4-982-100-01	INDIVIDUAL CARTON (ST-CDP) (AEP,UK,G,IT,CIS)	
*	4-982-441-01	INDIVIDUAL CARTON (SA) (EX90)	
*	4-983-403-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX50 : TH)	
*	4-983-404-01	INDIVIDUAL CARTON (TA-ST-TC-CDP) (EX70AV : TH)	

Sony Corporation
Consumer A&V Products Company
Home A&V Products Div.

English
96B090478-1
Printed in Japan

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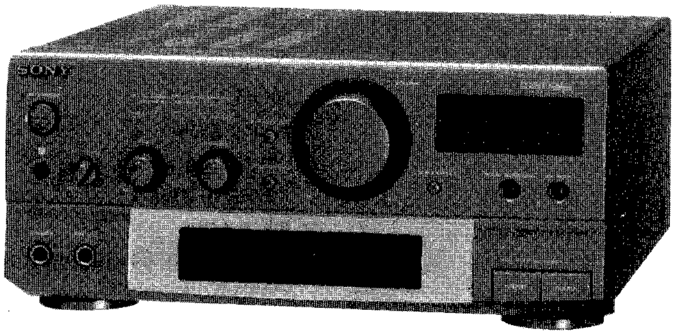
Published by Home A&V Products Div. Quality Engineering Dept.

TA-EX70

SERVICE MANUAL

AEP Model
UK Model
E Model



TA-EX70 is the amplifier section in MHC-EX70AV.

Photo : E model

SPECIFICATIONS

(AEP, UK, Italian, German models)

DIN power output

FRONT:	50 W + 50 W (6 ohms, at 1 kHz, DIN)
CENTER:	25 W (6 ohms, at 1 kHz, DIN)
REAR:	15 W + 15 W (8 ohms, at 1 kHz, DIN)

Continuous RMS power output

FRONT:	65 W + 65 W (6 ohms, at 1 kHz, 10% THD)
CENTER:	35 W (6 ohms, at 1 kHz, 10% THD)
REAR:	23 W + 23 W (8 ohms, at 1 kHz, 10% THD)

Music power output

FRONT:	105 W + 105 W (6 ohms, at 1 kHz, 10% THD)
CENTER:	45 W (6 ohms, at 1 kHz, 10% THD)
REAR:	25 W + 25 W (8 ohms, at 1 kHz, 10% THD)

(E, Saudi Arabia, Hong Kong, Malaysia, Singapore, Thailand models)

Continuous RMS power output

FRONT SPEAKER:
60 W + 60 W (6 ohms at 1 kHz, 5% THD)

CENTER SPEAKER:
30 W (6 ohms at 1 kHz, 5% THD)

REAR SPEAKER:
20 W + 20 W (8 ohms at 1 kHz, 5% THD)

Input	**Jack type**	**Sensitivity**	**Impedance**
CD	Phono	450 mV	47 kilohms
MD	Phono	450 mV	47 kilohms
TUNER	Phono	250 mV	47 kilohms
VIDEO1	Phono	250 mV	47 kilohms
VIDEO2	Phono	250 mV	47 kilohms
TAPE	Phono	250 mV	47 kilohms

Output	**Jack type**	**Voltage**	**Impedance**
MD	Phono	250 mV	1 kilohm
VIDEO1	Phono	250 mV	1 kilohm
TAPE	Phono	250 mV	1 kilohm
PHONES	Stereo phone	—	Accepts headphones of 8 ohms or more

MONITOR OUT (phono jack):
1 Vp-p/75 ohms

FRONT SPEAKER:
accepts speakers of 6 to 16 ohms

CENTER SPEAKER:
accepts speakers of 6 to 16 ohms

REAR SPEAKER:
accepts speakers of 8 to 16 ohms

Dimensions
Approx. 280 x 122.5 x 290 mm
(11 1/8 x 4 7/8 x 11 1/2 in) (w/h/d)
incl. projecting parts and controls

Mass
(AEP, UK, Italian, German models)
Approx. 6.3 kg
(13 lb 14 oz)
(E, Saudi Arabia, Hong Kong, Malaysia, Singapore, Thailand models)
Approx. 5.6 kg

General

Power requirements
(AEP, UK, Italian, German models)
220 - 230 V AC, 50/60 Hz
(Thailand model)
220 V AC, 50/60 Hz
(E, Saudi Arabia, Hong Kong, Malaysia, Singapore models)
110 - 120 V or
220 -240 V AC,
50/60 Hz
Adjustable with the voltage selector

Power consumption
210 W (system)

Design and specifications are subject to change without notice.

MICROFILM

AV CENTER AMPLIFIER

SONY®

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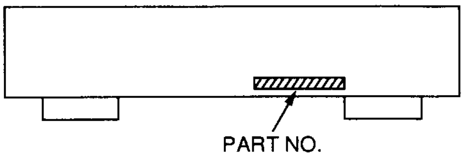
MODEL IDENTIFICATION

— BACK PANEL —



MODEL	PART NO.
AEP model	4-978-973-0☐
German model	4-978-973-1☐
Italian model	4-978-973-2☐
UK model	4-978-973-3☐
E, Malaysia, Singapore model	4-978-973-4☐
Hong Kong model	4-978-973-5☐
Saudi Arabia model	4-978-973-6☐
Thailand model	4-978-973-7☐

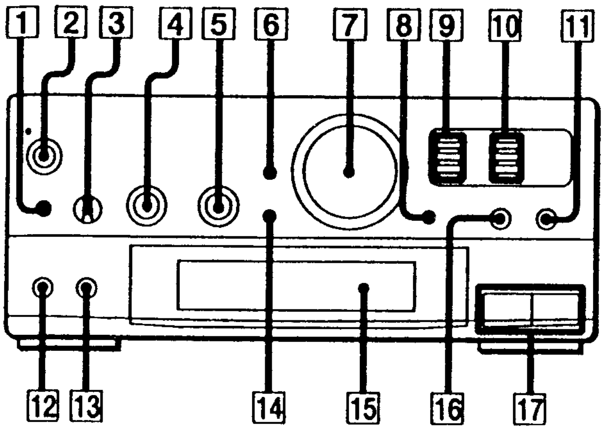
SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1
GENERAL

This section is extracted from instruction manual.

Index to Parts and Controls



1 Remote sensor
2 SYSTEM POWER switch and
ON/STANDBY indicator (7)
The indicator remains lit as long as the AC power cord is connected to a wall outlet.
3 MIC LEVEL control (25)
(E, EA, HK, SP, MY, TH models)
4 BASS control (18)
5 TREBLE control (18)
6 KARAOKE PON button* (25)
(E, EA, HK, SP, MY, TH models)
7 VOLUME control (5, 7, 18, 23)
8 SOURCE DIRECT button* (18, 22)
9 PRO LOGIC MODE indicators (21)
10 DSP MENU indicators (19)
11 DSP MODE button (19)
12 PHONES jack (18, 26)
13 MIX MIC jack (25, 26)
(E, EA, HK, SP, MY, TH models)
14 MUTING button* (18)
15 Display window
16 DOLBY PRO LOGIC button (21, 22)
17 FUNCTION buttons
(13, 17, 21, 22, 25, 26)
VIDEO (21, 25, 26)
AUDIO (13, 17, 22, 25, 26)

- Abbreviation

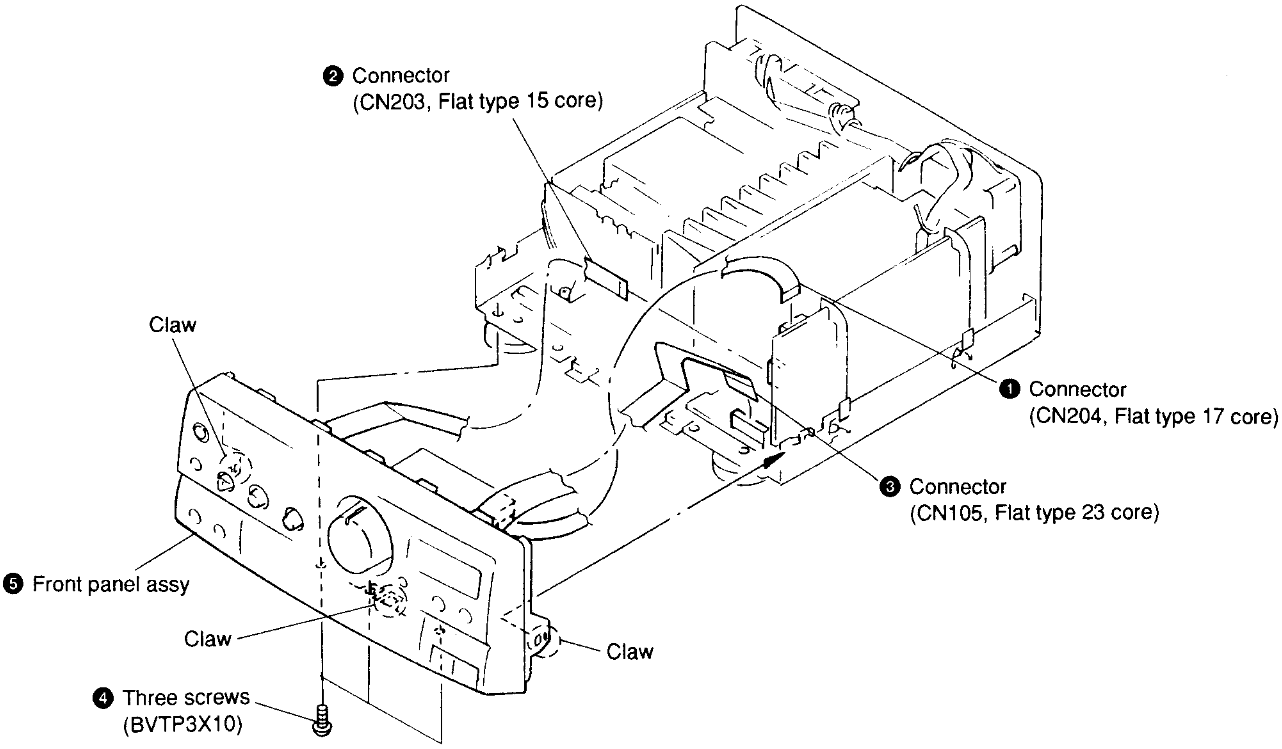
EA	: Saudi Arabia model.
HK	: Hong Kong model.
SP	: Singapore model.
MY	: Malaysia model.
TH	: Thailand model.

SECTION 2

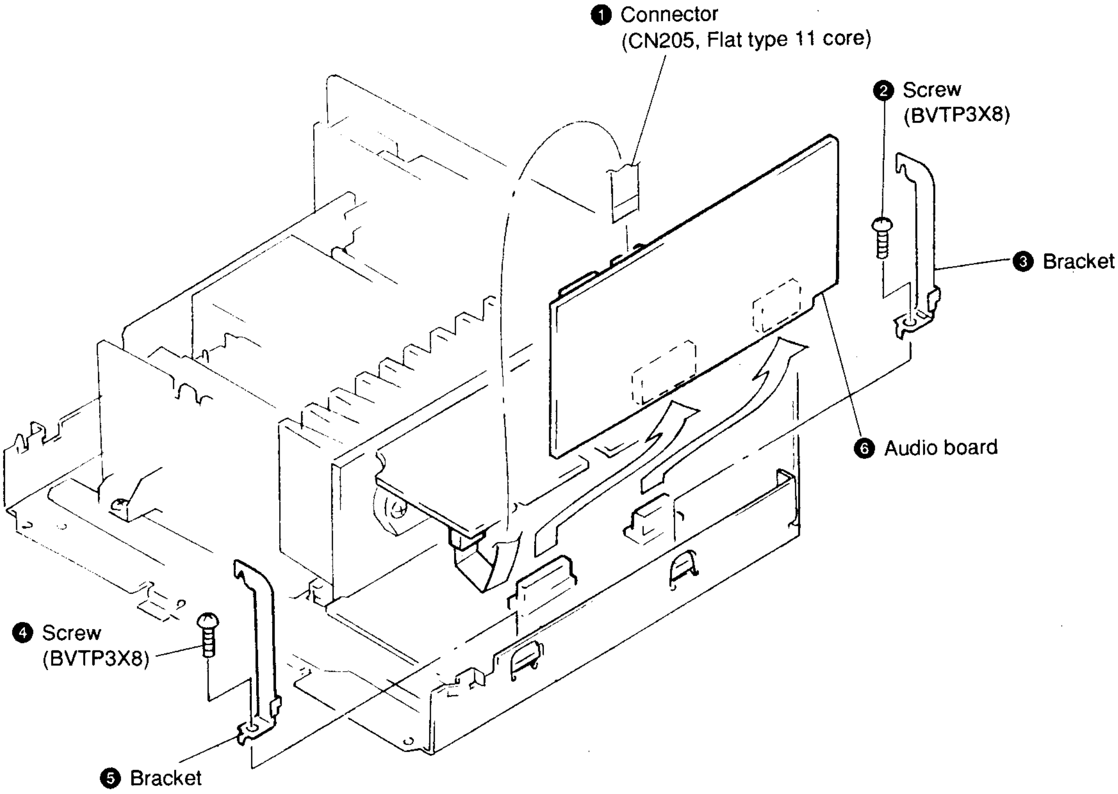
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

2-1. FRONT PANEL ASSY

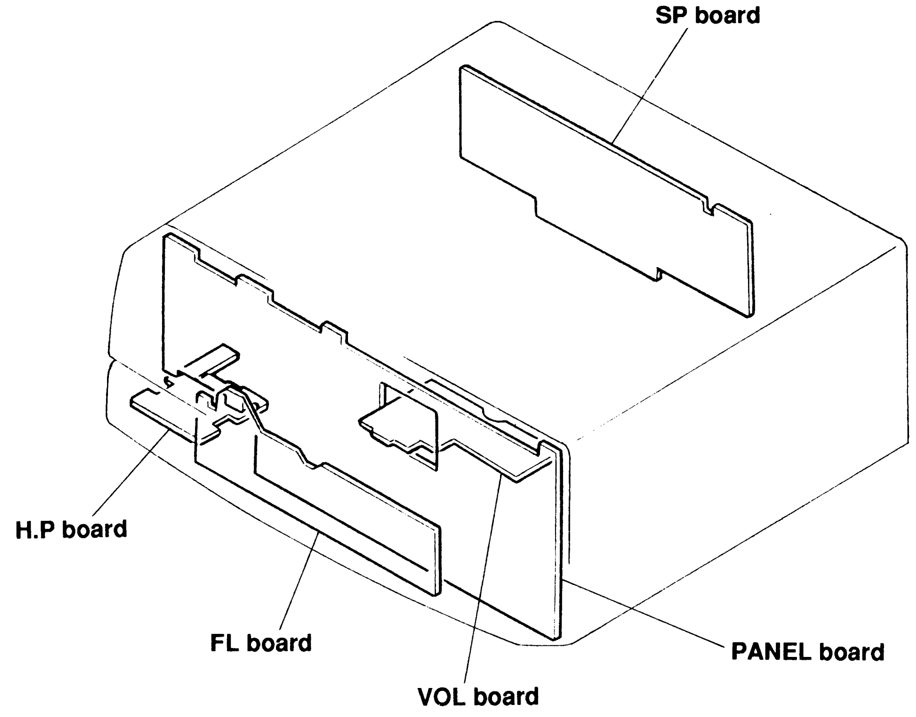

❷ Connector
(CN203, Flat type 15 core)
Claw
❶ Connector
(CN204, Flat type 17 core)
❸ Connector
(CN105, Flat type 23 core)
❺ Front panel assy
Claw
Claw
❹ Three screws
(BVTP3X10)

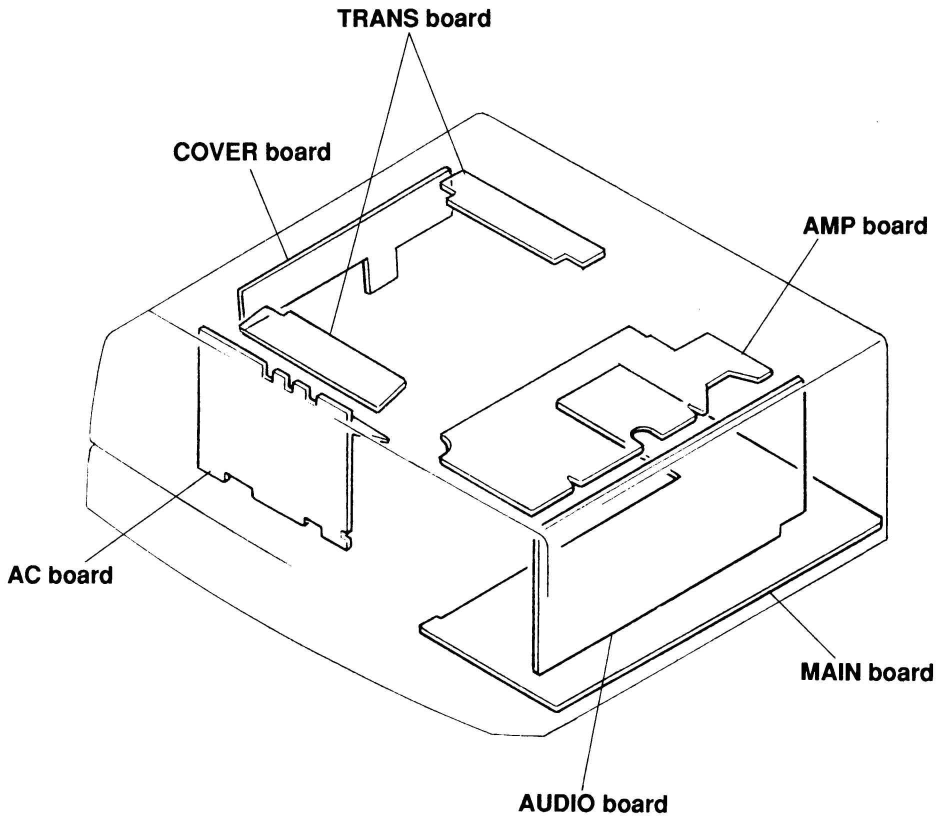
2-2. AUDIO BOARD


❶ Connector
(CN205, Flat type 11 core)
❷ Screw
(BVTP3X8)
❸ Bracket
❻ Audio board
❹ Screw
(BVTP3X8)
❺ Bracket

SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION





3-2. IC PIN FUNCTION

PANEL BOARD IC501 M37471M4-S3 (LED Drive, Mode Select)

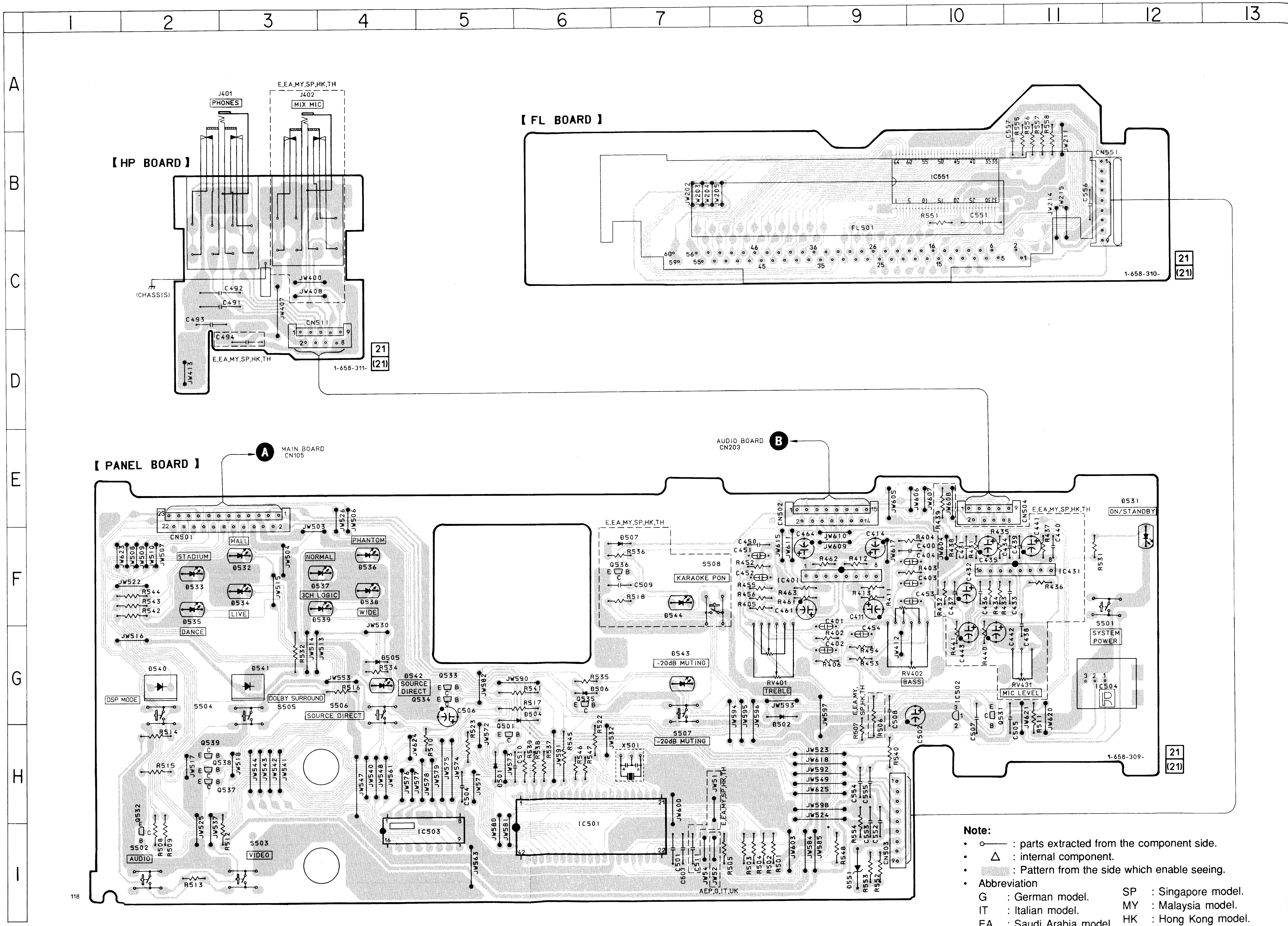
Pin No.	Pin Name	I/O	Function
1	——	–	Not used (Ground)
2	$\overline{CS}$	O	IC551 FL Driver control
3	SCK	O	
4	SDATA	O	
5	POWER ON	O	System power ON
6	SP RY ON	O	Speaker relay ON
7	LINEMUTE	O	Line mute ON
8	VOLUP	O	Volume up
9	VOLDOWN	O	Volume down
10	MENU1	O	LED Control
11	MENU0	O	
12	PROLOGIC	O	
13	DSP	O	
14	EFFECT	O	
15	PMT	O	Line mute control
16	KEY1	I	A/D input
17	KEY0	I	
18	VREF	I	A/D Reference Voltage
19	XIN	I	X'TAL input
20	XOUT	O	X'TAL output
21	VSS	I	Ground
22	VCC	I	+5V
23	E/$\overline{CE}$	I	Destination identification input. CE="H", E="L"
24	65/$\overline{75}$	I	Model identification input. Fixed "H"
25	$\overline{RESET}$	I	Reset input
26	MIC IN	I	Microphone detect input
27	AUBIN	I	AU BUS Input
28	SIRCSIN	I	SIRCS Input
29	——	–	Not used (Ground)
30	AUBOUT	O	AU BUS Output
31	A	O	IC101, 102, 103 Audio function control
32	B	O	
33	C	O	
34	CLK	O	IC301, 302 Prologic/DSP control
35	DATA	O	
36	ENBL	O	
37	$\overline{V1}$	O	IC181 Video function control
38	$\overline{V2}$	O	
39	KARAOKE	O	KARAOKE PON ON
40	-20MUTE	O	-20 dB Muting ON
41	DIRECT	O	Direct ON
42	——	–	Not used (Ground)

3-3. PRINTED WIRING BOARD — PANEL SECTION —

• See page 5 for Circuit Boards Location.

- **Semiconductor Location**

Ref. No.	Location
D501	H-5
D502	G-8
D504	G-6
D505	G-4
D506	G-6
D507	F-7
D531	F-12
D532	F-3
D533	F-2
D534	F-3
D535	F-2
D536	F-4
D537	F-3
D538	F-4
D539	F-3
D540	G-2
D541	G-3
D542	G-4
D543	G-7
D544	F-7
D551	I-9
IC401	F-9
IC431	F-11
IC501	I-6
IC502	G-10
IC503	I-5
IC504	G-11
IC551	B-10
Q501	H-5
Q531	G-10
Q532	I-2
Q533	G-5
Q534	G-5
Q535	G-6
Q536	F-7
Q537	H-2
Q538	H-2
Q539	H-2


1
2
3
4
5
6
7
8
9
10
11
12
13
A
B
C
D
E
F
G
H
I
【HP BOARD】
J401
PHONES
E,EA,MY,SP,HK,TH
J402
MIX MIC
(CHASSIS)
C492
C491
C493
C494
JW400
JW408
JW407
JW413
CN511
E,EA,MY,SP,HK,TH
1-658-311-
21
(21)
【FL BOARD】
IC551
FL501
CN551
R551
C551
1-658-310-
21
(21)
【PANEL BOARD】
MAIN BOARD
CN105
AUDIO BOARD
CN203
CN501
CN502
CN504
STADIUM
HALL
NORMAL
PHANTOM
3CH LOGIC
WIDE
LIVE
DANCE
DSP MODE
DOLBY SURROUND
SOURCE DIRECT
S504
S505
S506
E,EA,MY,SP,HK,TH
S508
KARAOKE PON
D543
-20dB MUTING
S507
-20dB MUTING
RV401
TREBLE
RV402
BASS
RV431
MIC LEVEL
D531
ON/STANDBY
S501
SYSTEM POWER
IC401
IC431
IC501
IC502
IC503
IC504
X501
S502
AUDIO
S503
VIDEO
AEP,G,IT,UK
1-658-309-
21
(21)
118

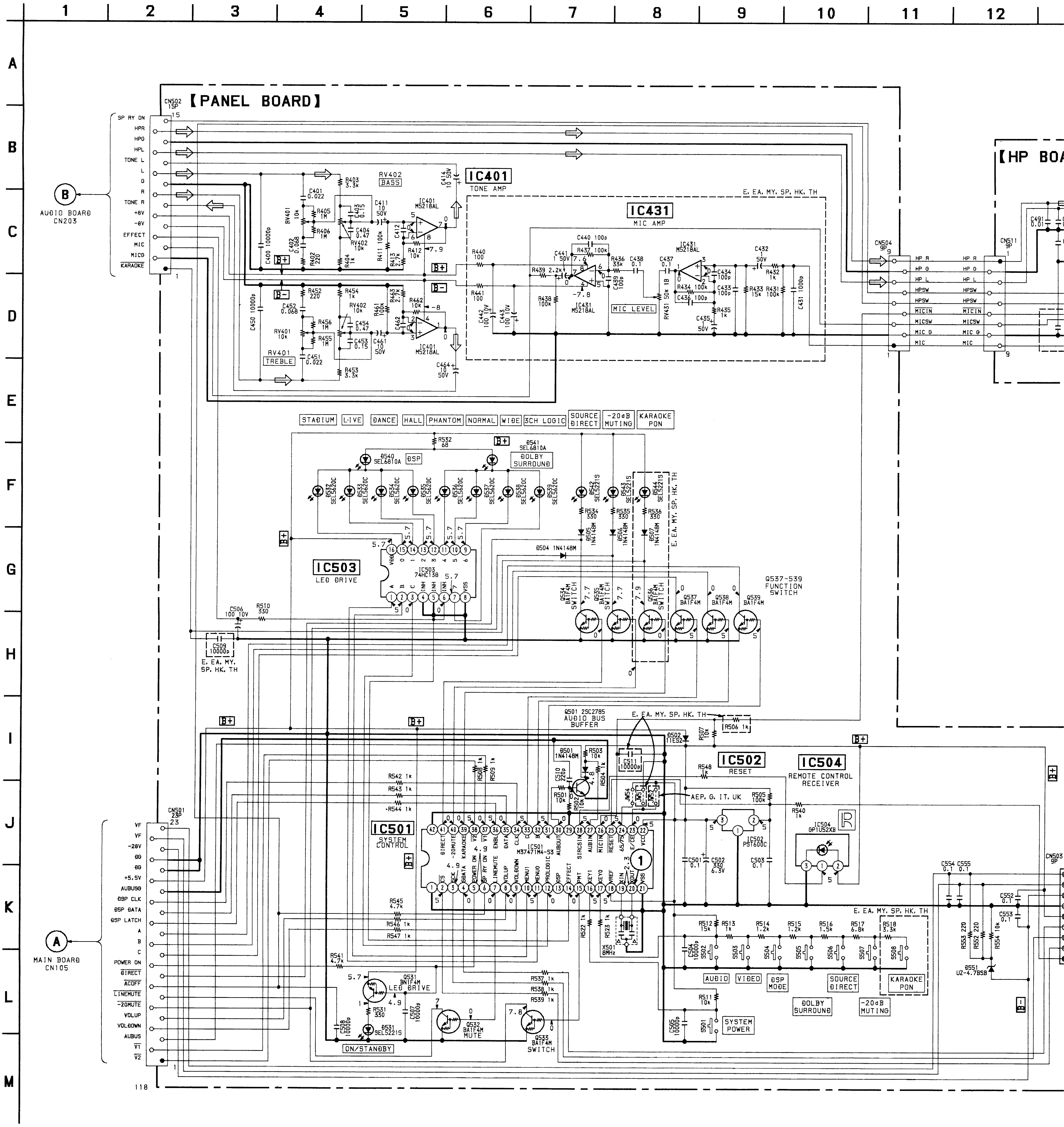
Note:

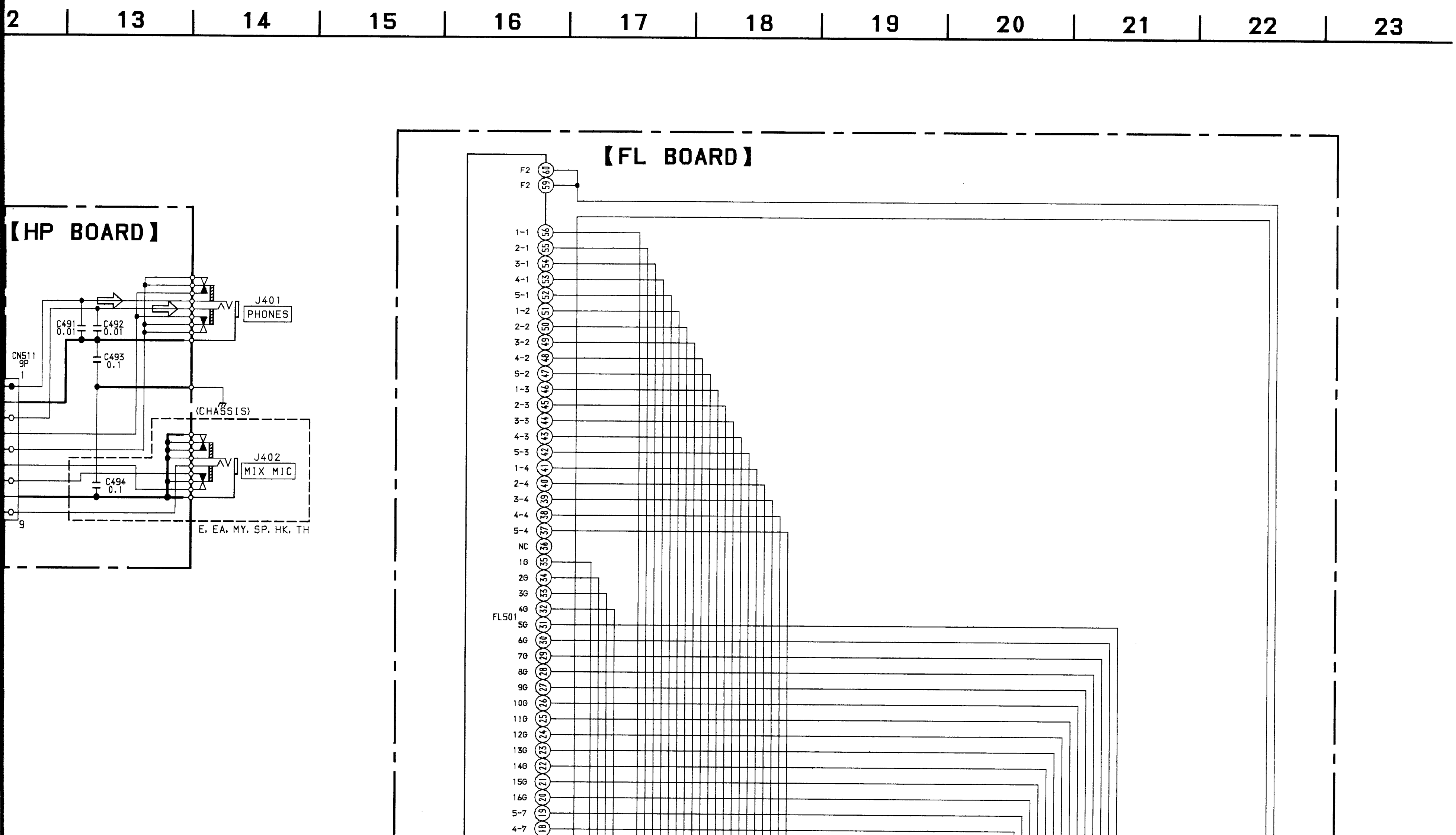
- ○—— : parts extracted from the component side.
- △ : internal component.
- ▨ : Pattern from the side which enable seeing.
- Abbreviation

G : German model.
IT : Italian model.
EA : Saudi Arabia model.
SP : Singapore model.
MY : Malaysia model.
HK : Hong Kong model.
TH : Thailand model.

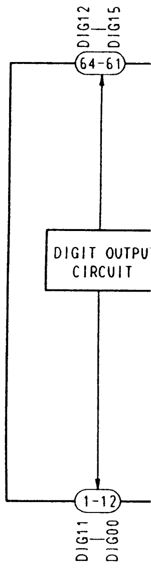
3-4. SCHEMATIC DIAGRAM — PANEL SECTION —

- See page 6 for IC Pin Function. (IC501)


1
2
3
4
5
6
7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
K
L
M
【PANEL BOARD】
CN502 15P
SP RY ON
HPR
HPG
HPL
TONE L
L
G
R
TONE R
+8V
-8V
EFFECT
MIC
MICG
KARAOKE
B
AUDIO BOARD CN203
IC401
TONE AMP
IC401 M5218AL
RV402 BASS
RV401 TREBLE
IC431
MIC AMP
IC431 M5218AL
MIC LEVEL
E, EA, MY, SP, HK, TH
CN504 9P
HP R
HP G
HP L
HPSW
MICIN
MICSW
MIC G
MIC
CN511 9P
【HP BO
STADIUM
LIVE
DANCE
HALL
PHANTOM
NORMAL
WIDE
3CH LOGIC
SOURCE DIRECT
-20dB MUTING
KARAOKE PON
D540 SEL6810A
DSP
D541 SEL6810A
DOLBY SURROUND
IC503
LED DRIVE
IC503 74HC138
D504 1N4148M
Q537-539 FUNCTION SWITCH
Q537 BA1F4M
Q538 BA1F4M
Q539 BA1F4M
C509 10000p
E, EA, MY, SP, HK, TH
Q501 2SC2785 AUDIO BUS BUFFER
Q502 1TES2
IC502
RESET
IC502 PST600C
IC504
REMOTE CONTROL RECEIVER
IC504 GP1U52XB
AEP, G, IT, UK
CN501 23P
VF
VF
-28V
DG
DG
+5.5V
AUBUSG
DSP CLK
DSP DATA
DSP LATCH
A
B
C
POWER ON
DIRECT
ACOFF
LINEMUTE
-20MUTE
VOLUP
VOLDOWN
AUBUS
V1
V2
A
MAIN BOARD CN105
IC501
SYSTEM CONTROL
IC501 M37471M4-53
X501 8MHz
Q531 BN1F4M LED DRIVE
D531 SEL5221S
ON/STANDBY
Q532 BA1F4M MUTE
Q533 BA1F4M SWITCH
AUDIO
VIDEO
DSP MODE
SOURCE DIRECT
KARAOKE PON
DOLBY SURROUND
-20dB MUTING
SYSTEM POWER
D551 UZ-4.7BSB
CN503 9P
118

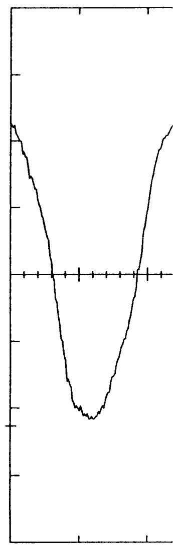

2
13
14
15
16
17
18
19
20
21
22
23
【HP BOARD】
J401
PHONES
J402
MIX MIC
(CHASSIS)
E, EA, MY, SP, HK, TH
C491 0.01
C492 0.01
C493 0.1
C494 0.1
CN511 9P
【FL BOARD】
FLS01
IC551
M66004M6FP
FL DRIVE
C551 100p
R551 27k
C556 0.1
C557 0.1
R558 1k
R557 1k
R556 1k
R555 1k
CN551 9P
CN503 9P
C552 0.1
C553 0.1
R554 10k
VF
VF
-28V
θG
+5V
SDATA
SCK
CS
RESET
B+
B–

• **IC Block Dia**
IC551 M660


DIG12
DIG15
64-61
DIGIT OUTPU
CIRCUIT
1-12
DIG11
DIG00

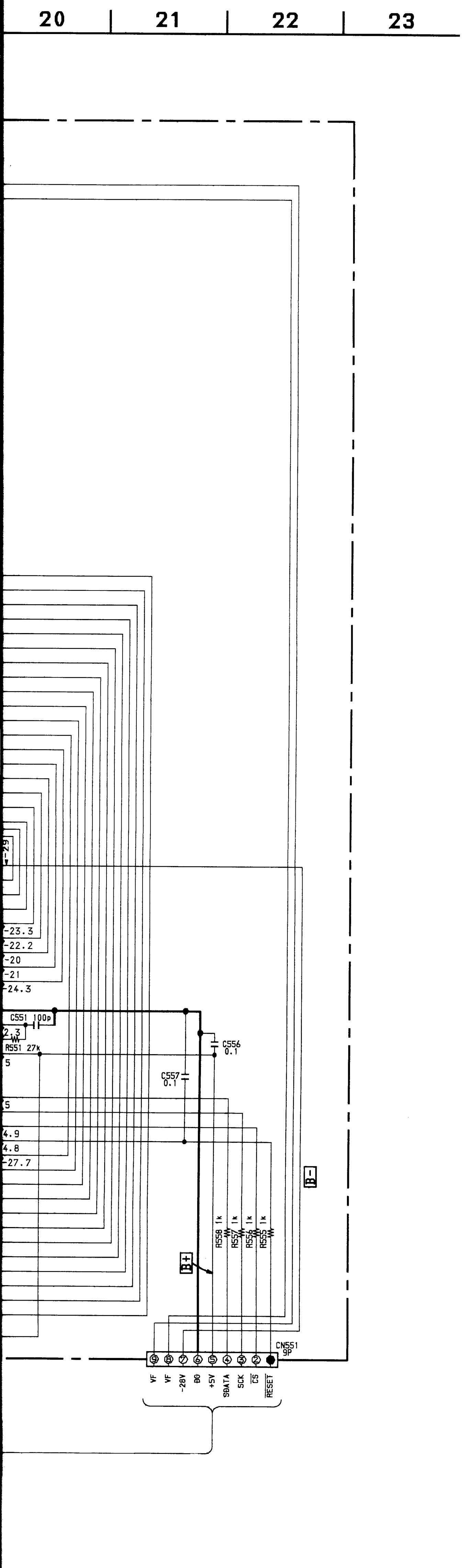
• **Waveform**

① IC501 ⑳ pi
8 MHz
4.5 Vp-p



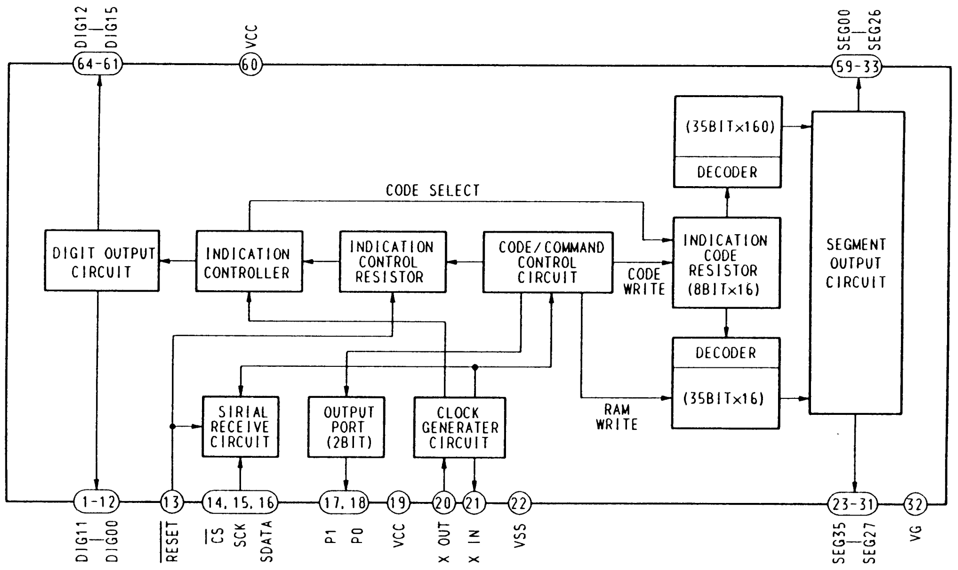
Note:

- All capacitors
50WV or less
tantalums.
- All resistors a
specified.
- Δ : inter
- ▭ : pane
- B+ : B+ L
- B– : B– L
- Voltage and
under no-sign
no mark : TU
- Voltages are t
Voltage variati
tolerances.
- Waveforms ar
Voltage variati
tolerances.
- Circled numbe
- Signal path.
⇨ : FM
- Abbreviation
G : Germa
IT : Italian
EA : Saudi
SP : Singap
MY : Malays
HK : Hong
TH : Thailar


20
21
22
23
-29
-23.3
-22.2
-20
-21
-24.3
C551 100p
R551 27k
C556 0.1
C557 0.1
4.9
4.8
-27.7
B-
B+
R558 1k
R557 1k
R556 1k
R555 1k
CN551 9P
VF
VF
-28V
BO
+5V
SDATA
SCK
CS
RESET

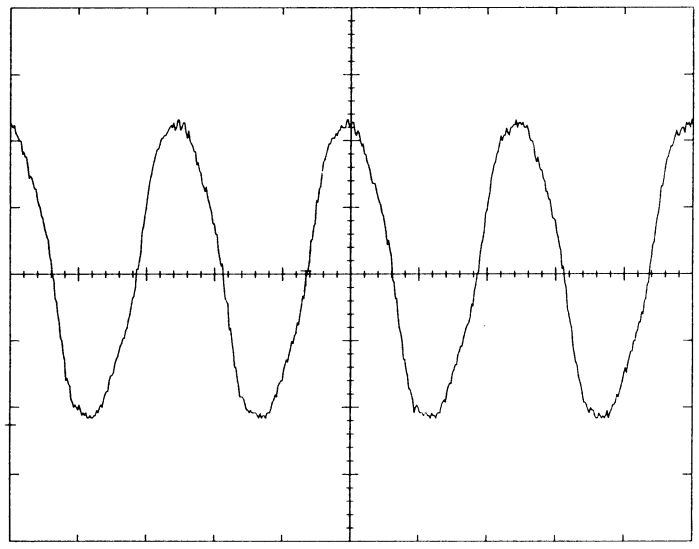
• IC Block Diagram

IC551 M66004M6FP


DIG12 – DIG15
64-61
VCC
60
SEG00 – SEG26
59-33
(35BITx160)
DECODER
CODE SELECT
DIGIT OUTPUT CIRCUIT
INDICATION CONTROLLER
INDICATION CONTROL RESISTOR
CODE/COMMAND CONTROL CIRCUIT
CODE WRITE
INDICATION CODE RESISTOR (8BITx16)
SEGMENT OUTPUT CIRCUIT
DECODER
(35BITx16)
RAM WRITE
SIRIAL RECEIVE CIRCUIT
OUTPUT PORT (2BIT)
CLOCK GENERATER CIRCUIT
1-12
13
14, 15, 16
17, 18
19
20
21
22
23-31
32
DIG11 – DIG00
RESET
CS
SCK
SDATA
P1
P0
VCC
X OUT
X IN
VSS
SEG35 – SEG27
VG

• Waveform

① IC501 ⑳ pin
8 MHz
4.5 Vp-p



Note:

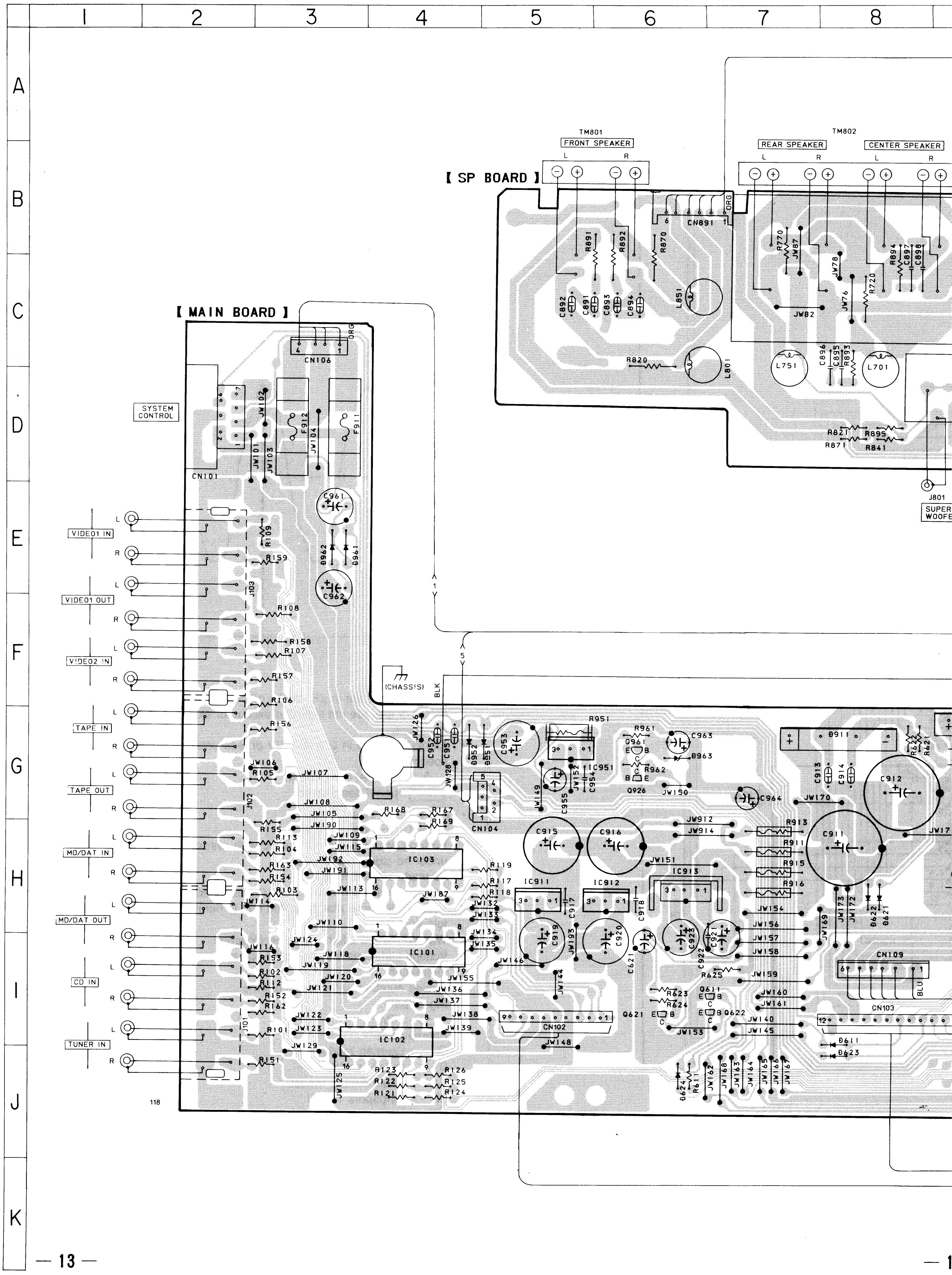
- All capacitors are in μF unless otherwise noted. pF:μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ : internal component.
- ☐ : panel designation.
- B+ : B+ Line
- B– : B– Line
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  no mark : TUNER MODE
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : FM
- Abbreviation
  G : German model.
  IT : Italian model.
  EA : Saudi Arabia model.
  SP : Singapore model.
  MY : Malaysia model.
  HK : Hong Kong model.
  TH : Thailand model.

3-5. PRINTED WIRING BOARD — MAIN SECTION —

• See page 5 for Circuit Boards Location.

• Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D191	I-11	IC911	H-5
D202	J-14	IC912	H-6
D601	C-16	IC913	H-6
D602	B-17	IC951	G-5
D603	B-17		
D611	J-8	Q181	C-9
D621	H-8	Q182	C-10
D622	H-8	Q183	C-10
D623	J-8	Q184	C-10
D624	J-6	Q185	C-10
D631	D-10	Q186	C-10
D632	D-10	Q201	J-14
D633	D-12	Q212	J-15
D634	D-12	Q221	B-22
D701	B-14	Q222	B-22
D702	C-15	Q223	B-22
D751	C-17	Q224	C-22
D801	C-17	Q241	G-20
D802	C-18	Q242	G-21
D851	C-19	Q243	G-21
D901	G-9	Q601	C-16
D911	G-8	Q602	C-16
D951	G-5	Q603	C-16
D952	G-4	Q605	B-16
D961	E-3	Q606	B-16
D962	E-3	Q607	B-16
D963	G-6	Q611	I-7
		Q621	I-6
IC101	I-4	Q622	I-7
IC102	J-4	Q631	D-12
IC103	H-4	Q632	D-12
IC181	C-9	Q633	D-12
IC191	J-10	Q634	C-12
IC201	I-20	Q701	D-15
IC211	G-17	Q751	C-17
IC221	H-15	Q801	C-17
IC241	H-20	Q841	C-15
IC301	H-18	Q842	C-15
IC302	I-18	Q851	D-20
IC701	E-16	Q926	G-6
IC801	E-19	Q961	G-6



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A
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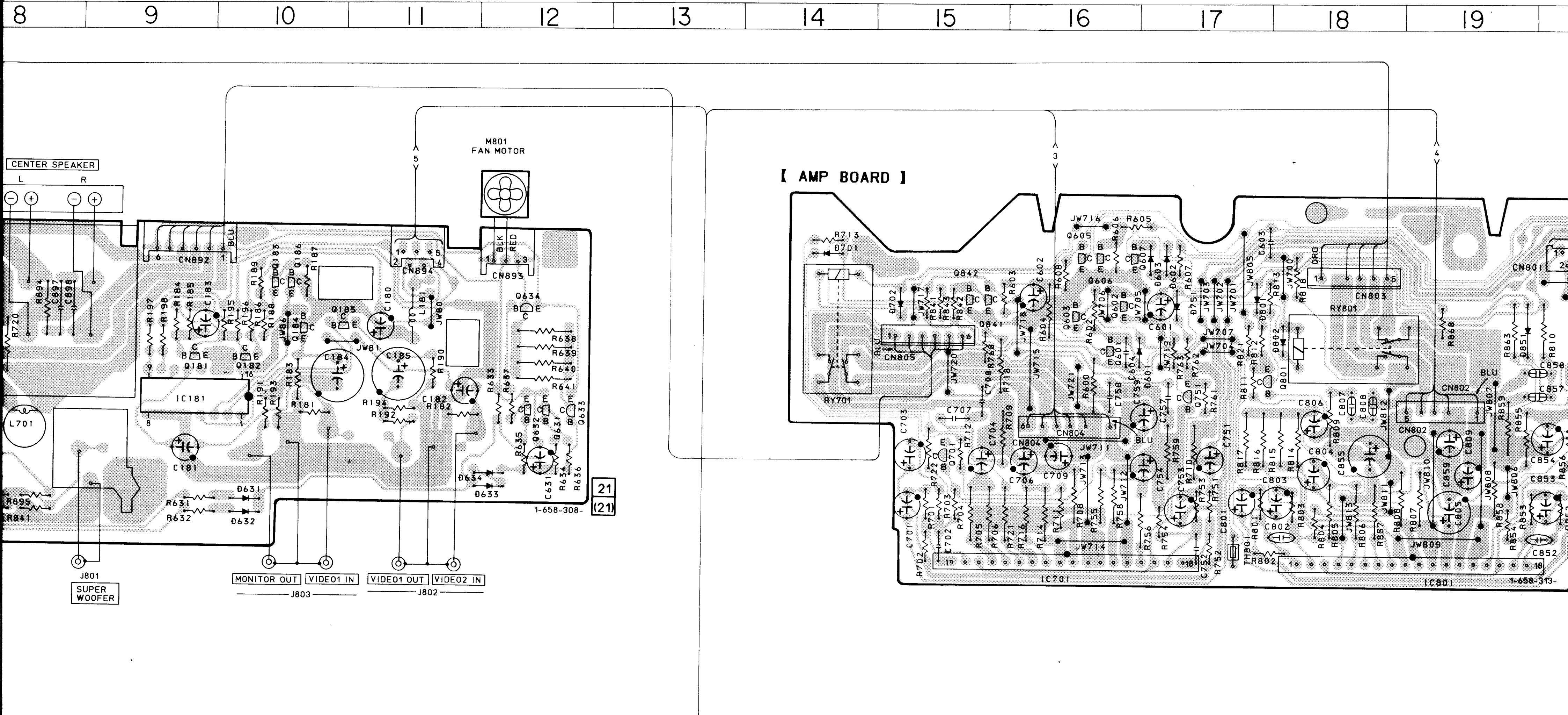
C
D
E
F
G
H
I
J
K
TM801
FRONT SPEAKER
L
R
TM802
REAR SPEAKER
CENTER SPEAKER
[SP BOARD]
CN891
ORG
R891
R892
R870
C892
C891
C893
C894
L851
R770
JW87
JW78
JW76
JW82
R720
R894
C897
C898
R820
L801
L751
C896
C895
R893
L701
R821
R895
R871
R841
J801
SUPER WOOFER
[MAIN BOARD]
CN106
SYSTEM CONTROL
CN101
JW101
JW102
JW103
JW104
F912
F911
C961
C962
D962
D961
VIDEO1 IN
VIDEO1 OUT
VIDEO2 IN
TAPE IN
TAPE OUT
MD/DAT IN
MD/DAT OUT
CD IN
TUNER IN
L
R
J103
J102
J101
R159
R108
R158
R107
R157
R106
R156
R105
JW106
JW107
JW108
JW105
JW190
R155
R113
R104
R163
R154
R103
JW114
JW109
JW115
JW192
JW191
JW113
IC103
R168
R167
R169
CN104
(CHASSIS)
BLK
JW126
JW128
C952
C951
D952
D951
C953
R951
R961
C963
Q961
D963
R962
IC951
C955
JW149
JW152
C954
Q926
JW150
C964
C915
C916
JW912
JW914
R913
R911
R915
R916
C913
C914
D911
C912
C911
JW170
JW151
IC911
IC912
IC913
R119
R117
R118
JW187
JW133
JW134
JW132
JW135
C917
C918
C919
C920
C621
C921
C922
JW154
JW156
JW157
JW158
JW159
JW169
JW173
JW172
D622
D621
JW110
JW124
JW116
JW118
JW119
JW120
JW121
R153
R102
R112
R152
R162
IC101
JW146
JW155
JW136
JW137
JW138
JW139
JW142
JW193
R625
R623
R624
Q611
Q621
Q622
JW140
JW161
JW145
JW153
CN109
CN103
BLU
CN102
JW148
D611
D623
JW122
JW123
JW129
R101
R151
IC102
R123
R122
R121
R126
R125
R124
JW125
D624
R611
JW162
JW168
JW163
JW164
JW165
JW166
118

Note:

- ○—— : parts extracted from the component side.
- △ : internal component.
- ▨ : Pattern from the side which enable seeing.
- Abbreviation

G	: German model.
IT	: Italian model.
EA	: Saudi Arabia model.
SP	: Singapore model.
MY	: Malaysia model.
HK	: Hong Kong model.
TH	: Thailand model.


8
9
10
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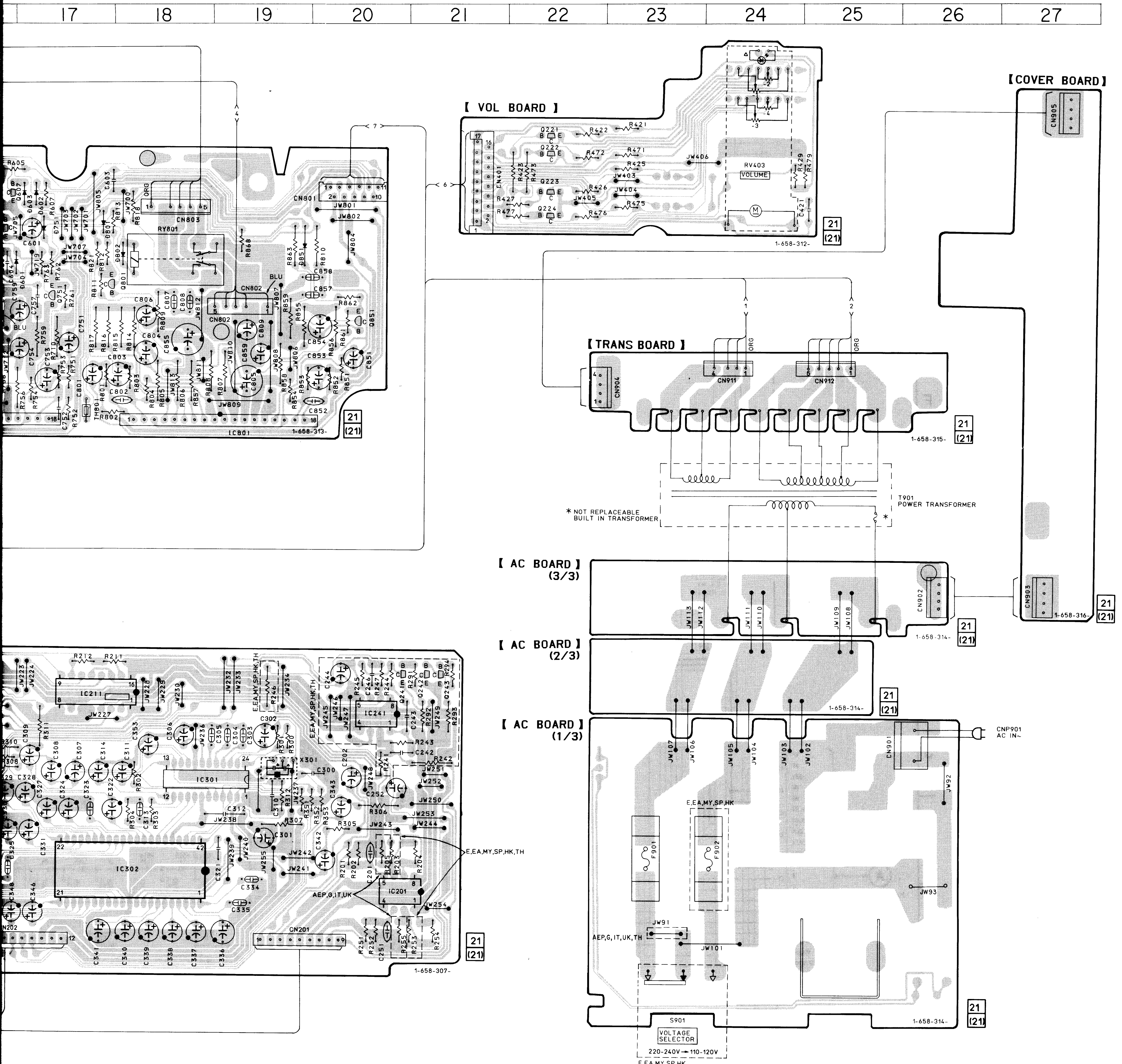
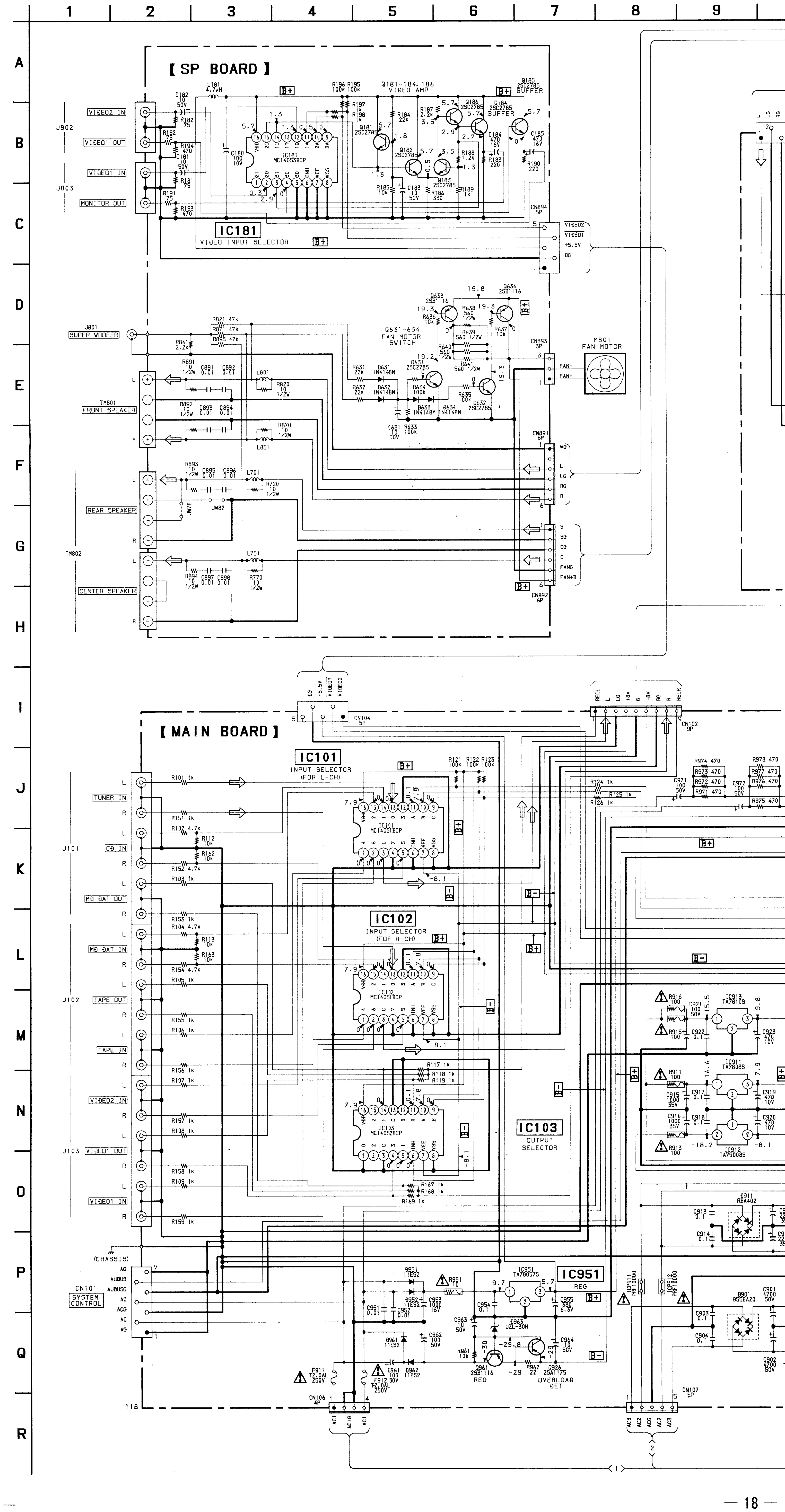
12
13
14
15
16
17
18
19
CENTER SPEAKER
L
R
M801
FAN MOTOR
BLK
RED
CN892
CN894
CN893
IC181
L701
J801
SUPER WOOFER
MONITOR OUT
VIDEO1 IN
J803
VIDEO1 OUT
VIDEO2 IN
J802
1-658-308-
21
(21)
【 AMP BOARD 】
RY701
CN805
CN804
RY801
CN803
CN801
CN802
IC701
IC801
1-658-313-
B901
ICP911
ICP912
CN107
CN105
CN109
CN103
CN108
IC191
A
PANEL BOARD
CN501
1-658-306-
21
(21)
【 AUDIO BOARD 】
B
PANEL BOARD
CN502
CN204
CN205
CN203
IC211
IC221
IC301
IC302
X301
CN202
CN201
AEP,G



17
18
19
20
21
22
23
24
25
26
27
【 VOL BOARD 】
RV403
VOLUME
CN401
Q221
Q222
Q223
Q224
JW406
1-658-312-
【COVER BOARD】
CN905
CN903
1-658-316-
【TRANS BOARD】
CN904
CN911
CN912
ORG
1-658-315-
T901
POWER TRANSFORMER
* NOT REPLACEABLE
BUILT IN TRANSFORMER
【 AC BOARD 】
(3/3)
CN902
1-658-314-
【 AC BOARD 】
(2/3)
1-658-314-
【 AC BOARD 】
(1/3)
CNP901
AC IN~
CN901
F901
F902
E,EA,MY,SP,HK
AEP,G,IT,UK,TH
JW91
JW101
JW92
JW93
S901
VOLTAGE
SELECTOR
220-240V → 110-120V
E,EA,MY,SP,HK
RY801
CN801
CN802
CN803
IC801
BLU
1-658-313-
IC211
IC241
IC301
IC302
IC201
CN201
E,EA,MY,SP,HK,TH
AEP,G,IT,UK
1-658-307-
21
(21)

3-6. SCHEMATIC DIAGRAM — MAIN SECTION —
• See page 21 for IC Block Diagrams.



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A
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C
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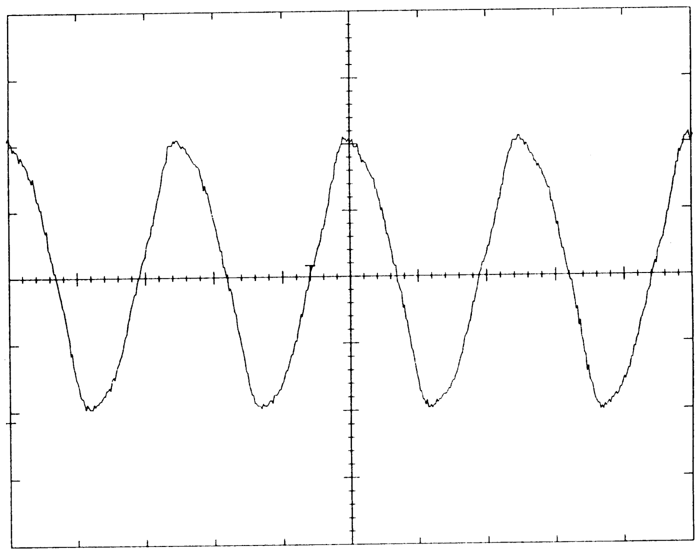
G
H
I
J
K
L
M
N
O
P
Q
R
[SP BOARD]
J802
VIDEO2 IN
VIDEO1 OUT
VIDEO1 IN
MONITOR OUT
J803
IC181
VIDEO INPUT SELECTOR
IC181 MC14053BCP
Q181-184, 186 VIDEO AMP
Q185 2SC2785 BUFFER
Q184 2SC2785 BUFFER
CN894 5P
VIDEO2
VIDEO1
+5.5V
BG
J801
SUPER WOOFER
Q631-634 FAN MOTOR SWITCH
CN893 3P
FAN-
FAN+
M801 FAN MOTOR
TM801
FRONT SPEAKER
REAR SPEAKER
TM802
CENTER SPEAKER
CN891 6P
CN892 6P
WG
L
LG
RG
R
S
SG
CG
C
FANG
FAN+B
CN104 5P
[MAIN BOARD]
IC101
INPUT SELECTOR (FOR L-CH)
IC101 MC14051BCP
IC102
INPUT SELECTOR (FOR R-CH)
IC102 MC14051BCP
IC103
OUTPUT SELECTOR
IC103 MC14052BCP
TUNER IN
CD IN
MD DAT OUT
MD DAT IN
TAPE OUT
TAPE IN
VIDEO2 IN
VIDEO1 OUT
VIDEO1 IN
J101
J102
J103
(CHASSIS)
CN101
SYSTEM CONTROL
AG
AUBUS
AUBUSG
AC
ACG
AC
AG
CN102 9P
RECL
L
LG
+8V
G
-8V
RG
R
RECR
IC913 TA7815S
IC911 TA7808S
IC912 TA79008S
IC951 TA78057S
IC951
REG
Q961 2SB1116 REG
Q926 2SA1175 OVERLOAD DET
D911 RBA402
D901 D5SBA20
F911 T2.0AL 250V
F912 T2.0AL 250V
CN106 4P
CN107 5P
AC1
AC1G
AC1
AC3
AC2
ACG
AC2
AC3

• **Waveform**

② IC301 ㉔ pin
8 MHz
4.2 Vp-p



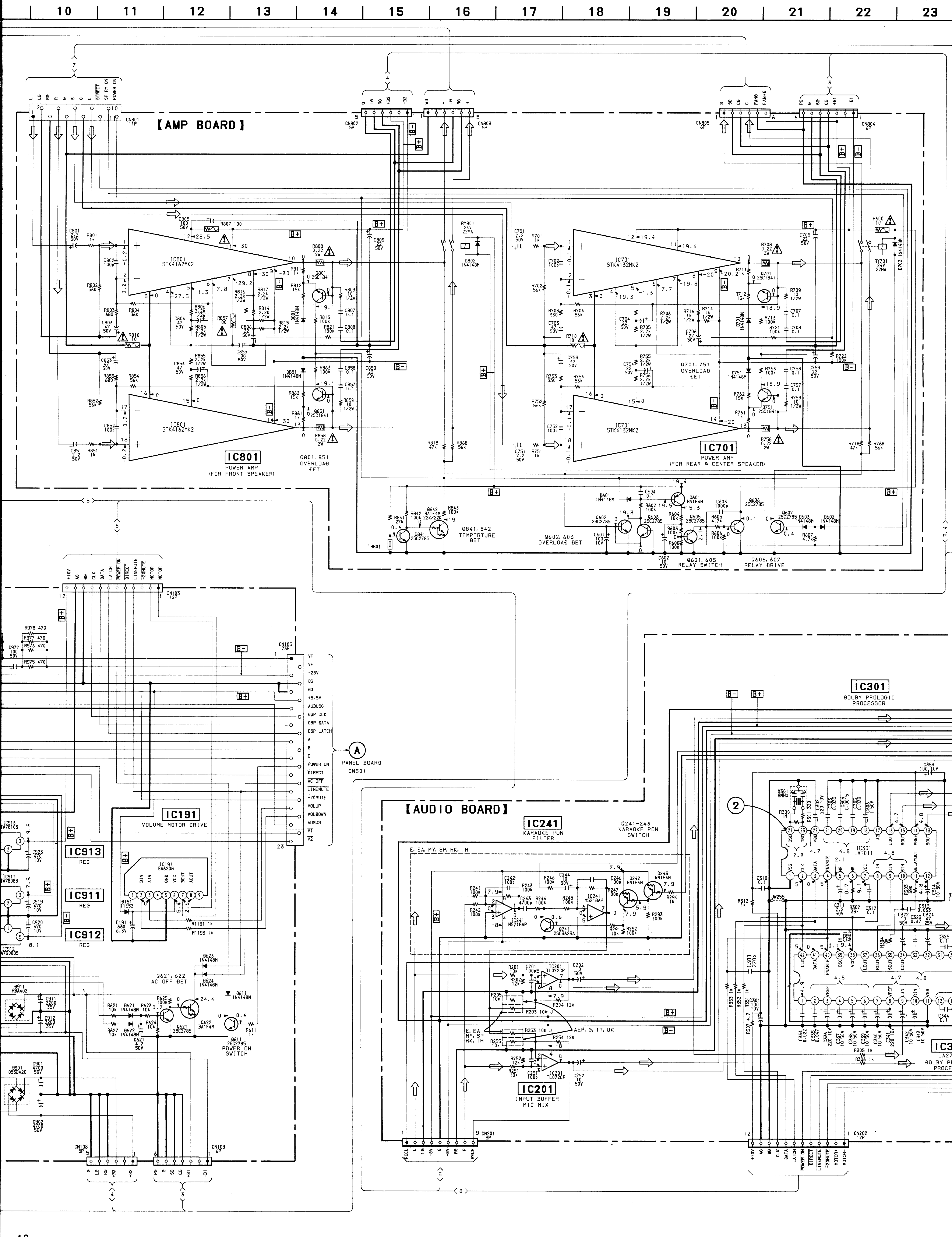
Note:

- All capacitors are in μF unless otherwise noted. pF:μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ : internal component.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ▭ : panel designation.

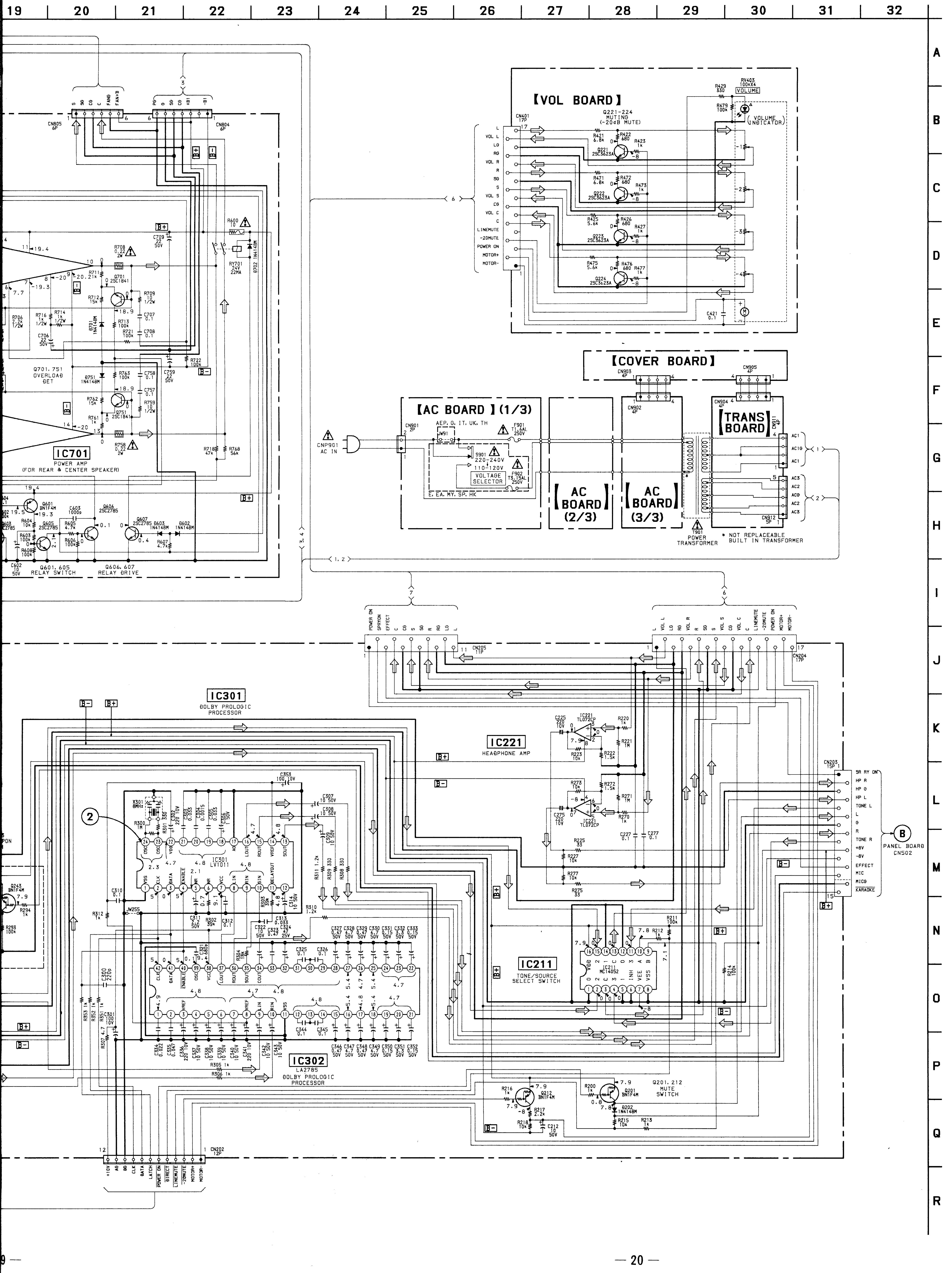
> **Note:** The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- **B+** : B+ Line
- **B–** : B– Line
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
  no mark : TUNER MODE
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : FM
- Abbreviation

G	: German model.
IT	: Italian model.
EA	: Saudi Arabia model.
SP	: Singapore model.
MY	: Malaysia model.
HK	: Hong Kong model.
TH	: Thailand model.

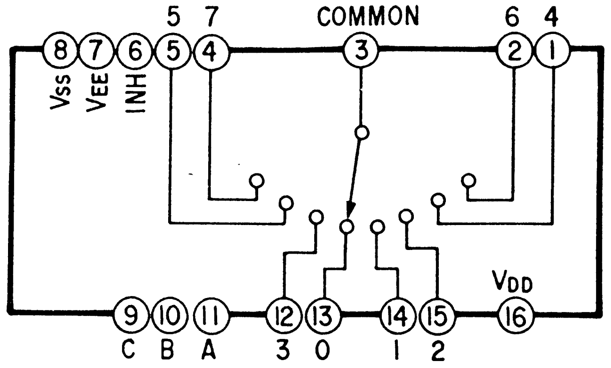


10
11
12
13
14
15
16
17
18
19
20
21
22
23
【AMP BOARD】
CN801 11P
CN802 5P
CN803 5P
CN805 6P
CN804 6P
IC801 STK4162MK2
IC801
POWER AMP
(FOR FRONT SPEAKER)
Q801, 851 OVERLOAD DET
IC701 STK4132MK2
IC701
POWER AMP
(FOR REAR & CENTER SPEAKER)
Q701, 751 OVERLOAD DET
RY801 24V 22MA
RY701 24V 22MA
Q841, 842 TEMPERTURE DET
Q602, 603 OVERLOAD DET
Q601, 605 RELAY SWITCH
Q606, 607 RELAY DRIVE
TH801
B+
B−
CN103 12P
CN105 23P
VF
VF
-28V
GG
GG
+5.5V
AUBUSG
DSP CLK
DSP DATA
DSP LATCH
A
B
C
POWER ON
DIRECT
AC OFF
LINEMUTE
-20MUTE
VOLUP
VOLDOWN
AUBUS
V1
V2
A
PANEL BOARD CN501
IC191
VOLUME MOTOR DRIVE
IC191 BA6208
IC913
REG
IC911
REG
IC912
REG
Q621, 622 AC OFF DET
Q611 2SC2785 POWER ON SWITCH
D911 RBA402
D901 D5SBA20
CN108 5P
CN109 6P
【AUDIO BOARD】
IC241
KARAOKE PON FILTER
Q241-243 KARAOKE PON SWITCH
E, EA, MY, SP, HK, TH
AEP, G, IT, UK
IC201
INPUT BUFFER MIC MIX
CN201 9P
CN202 12P
IC301
DOLBY PROLOGIC PROCESSOR
IC301 LV1011
IC3
LA27
DOLBY P
PROCE
2

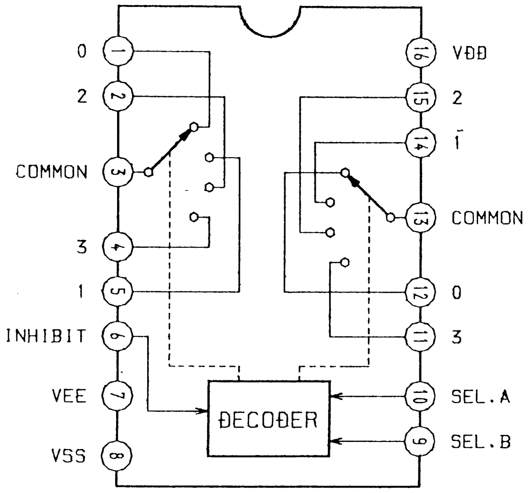

19
20
21
22
23
24
25
26
27
28
29
30
31
32
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
【VOL BOARD】
Q221-224
MUTING
(-20dB MUTE)
CN401 17P
RV403 100k×4 VOLUME
VOLUME INDICATOR
L
VOL L
LG
RG
VOL R
R
SG
S
VOL S
CG
VOL C
C
LINEMUTE
-20MUTE
POWER ON
MOTOR+
MOTOR-
【COVER BOARD】
CN903 4P
CN905 4P
【AC BOARD】(1/3)
CN901 2P
AEP, G, IT, UK, TH
F901 T1.6AL 250V
S901 220-240V 110-120V VOLTAGE SELECTOR
F902 T3.15AL 250V
E, EA, MY, SP, HK
CNP901 AC IN
【AC BOARD】(2/3)
【AC BOARD】(3/3)
CN902 4P
CN904 4P
【TRANS BOARD】
CN911 4P
CN912 5P
AC1
AC1G
AC3
AC2
AC0
T901 POWER TRANSFORMER
* NOT REPLACEABLE BUILT IN TRANSFORMER
CN805 6P
CN804 6P
IC701
POWER AMP
(FOR REAR & CENTER SPEAKER)
Q701, 751 OVERLOAD DET
RY701 24V 22MA
Q601, 605 RELAY SWITCH
Q606, 607 RELAY DRIVE
CN205 11P
CN204 17P
CN203 15P
SR RY ON
HP R
HP G
HP L
TONE L
L
G
R
TONE R
+8V
-8V
EFFECT
MIC
MICG
KARAOKE
PANEL BOARD CN502
IC301
DOLBY PROLOGIC PROCESSOR
IC301 LV1011
IC221
HEADPHONE AMP
IC221 TL072CP
IC211
TONE/SOURCE SELECT SWITCH
IC211 MC14052
IC302
LA2785
DOLBY PROLOGIC PROCESSOR
Q212 BN1F4M
Q201 BN1F4M
Q201, 212 MUTE SWITCH
D202 1N4148M
CN202 12P
+10V
AG
BG
CLK
DATA
LATCH
POWER ON
DIRECT
LINEMUTE
-20MUTE
MOTOR+
MOTOR-
X301 8MHz
JW255
②

3-7 . IC BLOCK DIAGRAMS — MAIN SECTION —

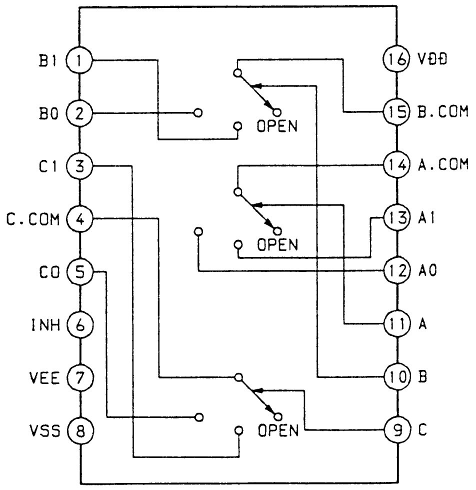
IC101, IC102 MC14051BCP


5 7
COMMON
6 4
8
7
6
5
4
3
2
1
Vss
VEE
INH
VDD
9
10
11
12
13
14
15
16
C B A
3 0
1 2

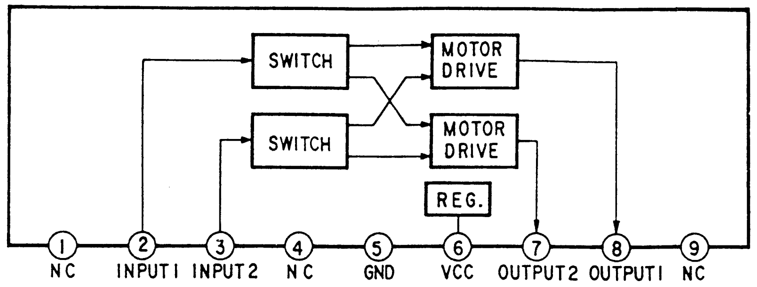
IC103, IC211 MC14052BCP


0
2
COMMON
3
1
INHIBIT
VEE
VSS
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9
VDD
2
1
COMMON
0
3
SEL.A
SEL.B
DECODER

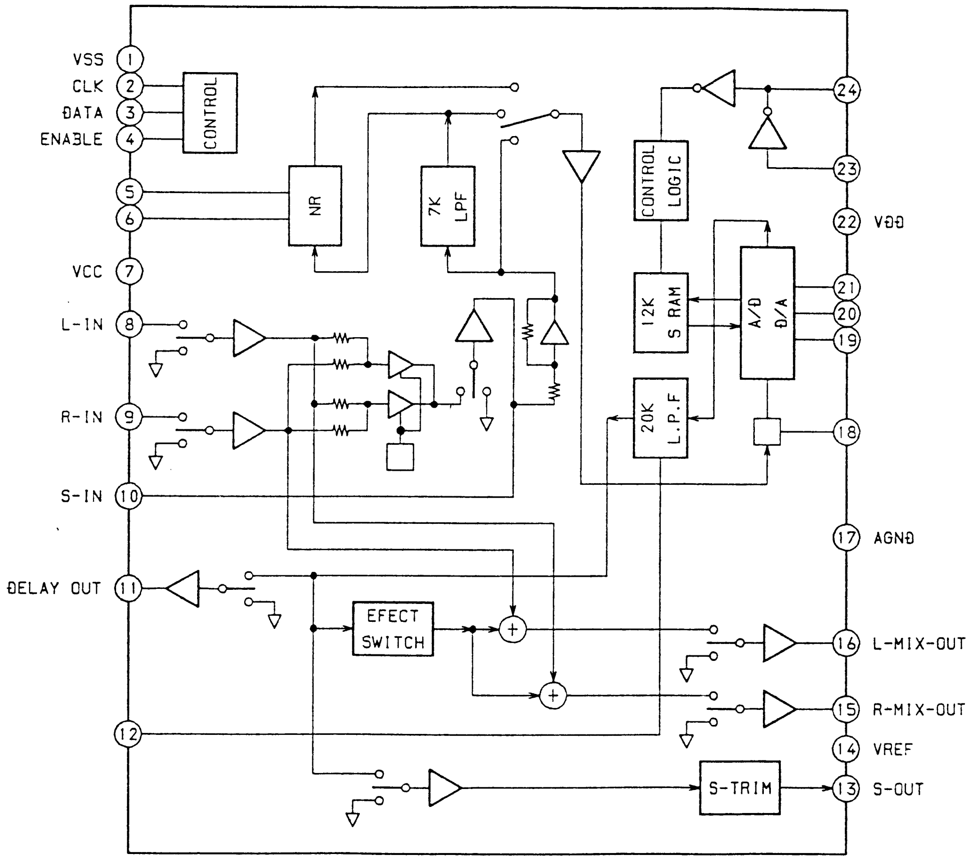
IC181 MC14053BCP


B1
B0
C1
C.COM
C0
INH
VEE
VSS
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9
VDD
B.COM
A.COM
A1
A0
A
B
C
OPEN
OPEN
OPEN

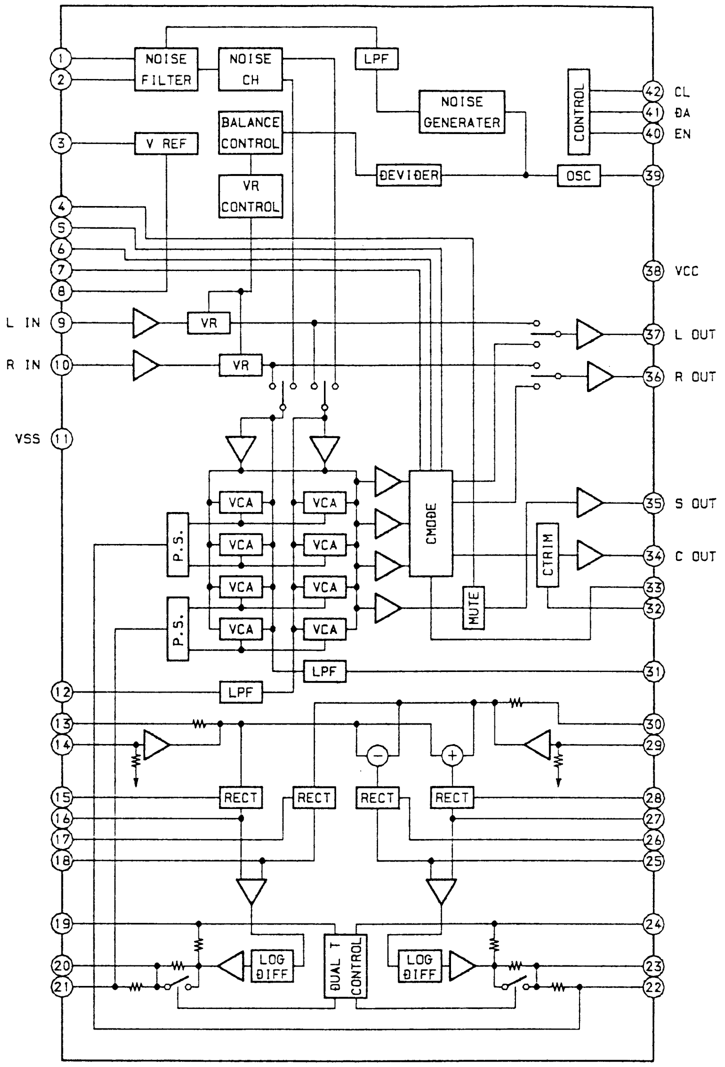
IC191 BA6208


SWITCH
SWITCH
MOTOR DRIVE
MOTOR DRIVE
REG.
1
2
3
4
5
6
7
8
9
NC
INPUT1
INPUT2
NC
GND
VCC
OUTPUT2
OUTPUT1
NC

IC301 LV1010N


VSS
CLK
DATA
ENABLE
VCC
L-IN
R-IN
S-IN
DELAY OUT
1
2
3
4
5
6
7
8
9
10
11
12
CONTROL
NR
7K LPF
CONTROL LOGIC
12K S RAM
A/D D/A
20K L.P.F
EFECT SWITCH
S-TRIM
24
23
22
21
20
19
18
17
16
15
14
13
VDD
AGND
L-MIX-OUT
R-MIX-OUT
VREF
S-OUT

IC302 LA2785


NOISE FILTER
NOISE CH
LPF
NOISE GENERATER
CONTROL
V REF
BALANCE CONTROL
VR CONTROL
DEVIDER
OSC
L IN
R IN
VSS
VR
VR
VCA
VCA
VCA
VCA
VCA
VCA
VCA
VCA
P.S.
P.S.
CMODE
MUTE
CTRIM
LPF
LPF
RECT
RECT
RECT
RECT
LOG DIFF
DUAL T CONTROL
LOG DIFF
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
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19
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21
42
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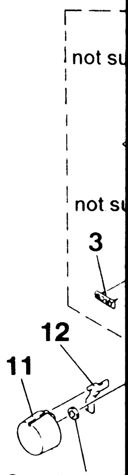
36
35
34
33
32
31
30
29
28
27
26
25
24
23
22
CL
DA
EN
VCC
L OUT
R OUT
S OUT
C OUT

NOTE:
- -XX, -X mea
have some dif
- Items marked
seldom requir
should be anti
- Color Indicati
KNOB, BAL

4-1. FRON


not su
not su
3
12
11

Supplied wit
RV403

Ref. No.	Part
1	X-494
1	X-494
1	X-494
1	X-494
2	4-977
2	4-977
3	4-962
4	4-977
4	4-977
5	4-979
6	4-977
6	4-977
6	4-977
7	4-977
8	4-977
8	4-977
9	4-977
10	4-977
10	4-977
11	4-970

SECTION 4
EXPLODED VIEWS

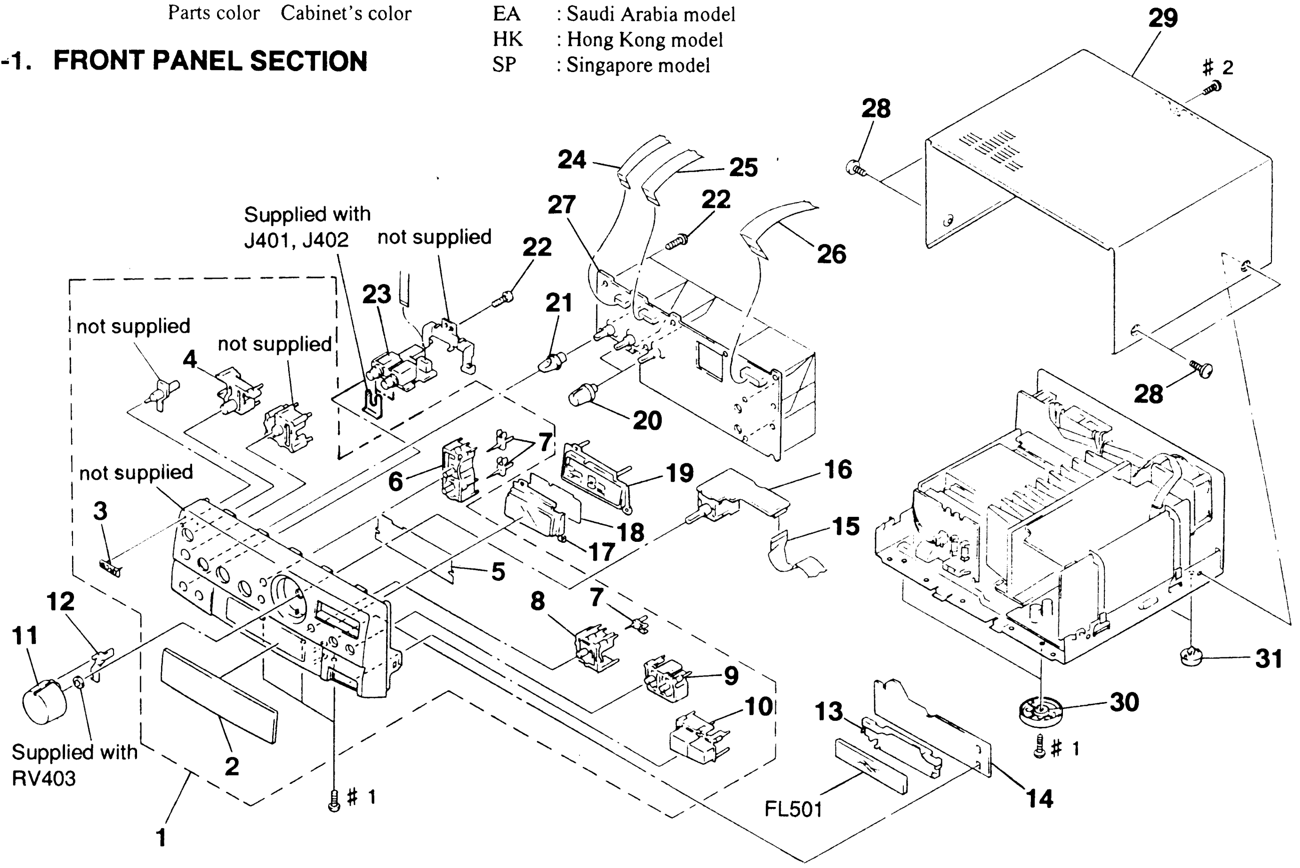
NOTE:
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts color Cabinet's color

- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation

G : German model
IT : Italian model
EA : Saudi Arabia model
HK : Hong Kong model
SP : Singapore model
MY : Malaysia model
TH : Thailand model

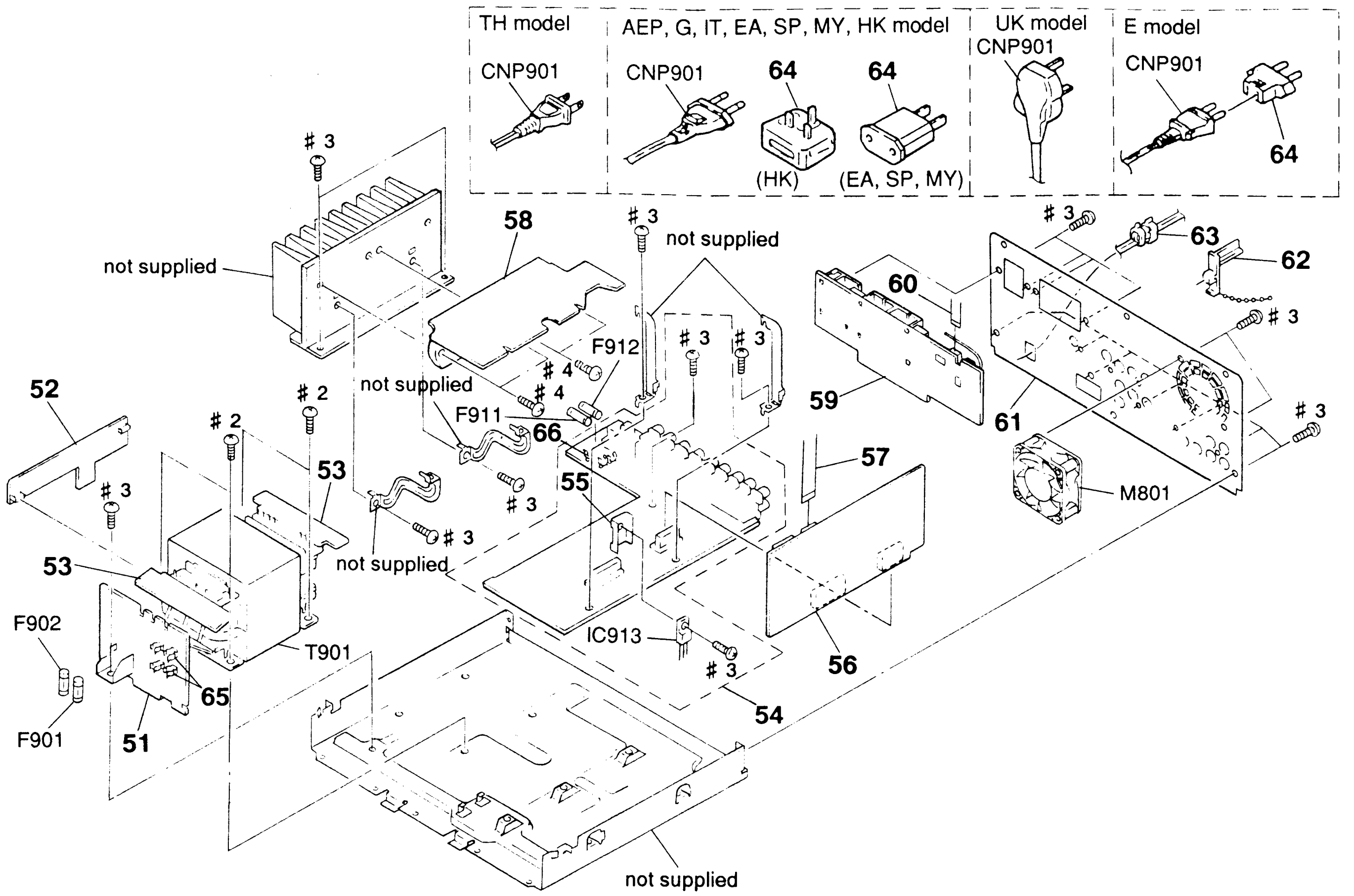
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

4-1. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
1	X-4946-592-1	PANEL ASSY (S), FRONT (GRAY)... (SILVER)	(E, EA, MY, SP, HK)
1	X-4946-593-1	PANEL ASSY (S), FRONT (GRAY)... (SILVER)	(AEP, UK, G, IT)
1	X-4946-858-1	PANEL ASSY (B), FRONT (BLACK)... (BLACK)	(AEP, UK, G, IT)
1	X-4946-964-1	PANEL ASSY (SP), FRONT (GRAY)... (SILVER)	(TH)
2	4-977-683-11	WINDOW (FL) (GRAY)... (SILVER)	
2	4-977-683-21	WINDOW (FL) (BLACK)... (BLACK)	
3	4-962-708-11	EMBLEM (4-A), SONY	
4	4-977-708-11	BUTTON (POWER) (GRAY)... (SILVER)	
4	4-977-708-21	BUTTON (POWER) (BLACK)... (BLACK)	
5	4-979-352-21	FILTER (CD)	
6	4-977-736-11	BUTTON (MUTE) (GRAY)... (SILVER)	(AEP, UK, G, IT)
6	4-977-736-21	BUTTON (MUTE) (GRAY)... (SILVER)	(E, EA, MY, SP, HK, TH)
6	4-977-736-31	BUTTON (MUTE) (BLACK)... (BLACK)	(AEP, UK, G, IT)
7	4-977-740-11	INDICATOR (MUTE)	
8	4-977-737-11	BUTTON (SD) (GRAY)... (SILVER)	
8	4-977-737-21	BUTTON (SD) (BLACK)... (BLACK)	
9	4-977-738-11	BUTTON (DSP)	
10	4-977-739-11	BUTTON (FUNC) (GRAY)... (SILVER)	
10	4-977-739-31	BUTTON (FUNC) (BLACK)... (BLACK)	
11	4-970-955-21	KNOB (VOL) (BLACK)... (BLACK)	
11	4-970-955-31	KNOB (VOL) (GRAY)... (SILVER)	
12	4-979-349-11	INDICATOR (VOL)	
* 13	4-979-799-01	HOLDER (FL)	
* 14	1-658-310-21	FL BOARD	
15	1-773-038-11	WIRE (FLAT TYPE) (17 CORE)	
* 16	1-658-312-21	VOL BOARD	
17	4-977-741-11	WINDOW (DSP)	
18	4-977-743-11	WINDOW (DSP 2)	
19	4-977-747-11	HOLDER (LED-8)	
20	4-970-965-21	KNOB (TONE) (BLACK)... (BLACK)	
20	4-970-965-31	KNOB (TONE) (GRAY)... (SILVER)	
21	4-973-043-31	KNOB (KR) (GRAY)... (SILVER)	(E, EA, MY, SP, HK, TH)
22	4-951-620-01	SCREW (2.6X8), +BVTP	
* 23	1-658-311-21	H.P BOARD	
24	1-769-910-11	WIRE (FLAT TYPE) (9 CORE)	
25	1-765-332-11	WIRE (FLAT TYPE) (15 CORE)	
26	1-776-933-11	WIRE (FLAT TYPE) (23 CORE)	
* 27	A-4378-829-A	PANEL BOARD, COMPLETE (E, EA, MY, SP, HK, TH)	
* 27	A-4378-837-A	PANEL BOARD, COMPLETE (AEP, UK, G, IT)	
28	3-363-099-01	SCREW (CASE 3 TP2)	
29	4-978-245-31	CASE (GRAY)... (SILVER)	
29	4-980-744-41	CASE (BLACK)... (BLACK)	
30	4-977-699-11	LEG (F)	
31	4-965-822-01	FOOT	
FL501	1-517-367-11	INDICATOR TUBE, FLUORESCENT	

4-2. CHASSIS SECTION



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 51	1-658-314-21	AC BOARD	
* 52	1-658-316-21	COVER BOARD	
* 53	1-658-315-21	TRANSFORMER BOARD	
* 54	A-4378-834-A	MAIN BOARD, COMPLETE (E, EA, MY, SP, HK, TH)	
* 54	A-4378-845-A	MAIN BOARD, COMPLETE (AEP, UK, G, IT)	
* 55	3-309-144-21	HEAT SINK	
* 56	A-4378-835-A	AUDIO BOARD, COMPLETE (E, EA, MY, SP, HK, TH)	
* 56	A-4378-846-A	AUDIO BOARD, COMPLETE (AEP, UK, G, IT)	
57	1-769-940-11	WIRE (FLAT TYPE) (11 CORE)	
* 58	A-4378-832-A	AMP BOARD, COMPLETE (E, EA, MY, SP, HK, TH)	
* 58	A-4378-841-A	AMP BOARD, COMPLETE (AEP, UK, G, IT)	
* 59	A-4378-836-A	SP BOARD, COMPLETE (E, EA, MY, SP, HK, TH)	
* 59	A-4378-847-A	SP BOARD, COMPLETE (AEP, UK, G, IT)	
60	1-769-848-11	WIRE (FLAT TYPE) (5 CORE)	
* 61	4-978-973-01	PANEL, BACK (AEP)	
* 61	4-978-973-11	PANEL, BACK (G)	
* 61	4-978-973-21	PANEL, BACK (IT)	
* 61	4-978-973-31	PANEL, BACK (UK)	
* 61	4-978-973-41	PANEL, BACK (E, MY, SP)	
* 61	4-978-973-51	PANEL, BACK (HK)	
* 61	4-978-973-61	PANEL, BACK (EA)	
* 61	4-978-973-71	PANEL, BACK (TH)	
62	4-956-370-02	BAND, PLUG FIXED (UK, HK)	
* 63	3-703-244-00	BUSHING (2104), CORD	(AEP, UK, G, IT, EA, MY, SP, HK)
* 63	3-703-571-11	BUSHING (S) (4516), CORD (E, TH)	
⚠64	1-569-007-11	ADAPTER, CONVERSION 2P (E)	
⚠64	1-569-008-11	ADAPTER, CONVERSION 2P (EA, MY, SP)	
⚠64	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (HK)	
65	1-533-217-31	HOLDER, FUSE	
66	1-533-233-11	HOLDER, FUSE	
⚠CNP901	1-575-651-11	CORD, POWER (AEP, G, IT, EA, MY, SP, HK)	
⚠CNP901	1-575-653-11	CORD, POWER (E)	
⚠CNP901	1-751-326-31	CORD, POWER (TH)	
⚠CNP901	1-751-520-21	CORD, POWER (UK)	
⚠F901	1-532-259-00	FUSE TIME LAG (1.6A, 250V)	(AEP, UK, G, IT, E, EA, MY, SP, HK)
⚠F902	1-532-237-00	FUSE TIME LAG (3.15A, 250V)	(E, EA, MY, SP, HK)
⚠F911	1-532-203-00	FUSE TIME LAG (2A, 250V)	
⚠F912	1-532-203-00	FUSE TIME LAG (2A, 250V)	
IC913	8-759-231-57	IC TA7810S	
M801	1-698-748-11	MOTOR, FAN (DC)	
⚠T901	1-429-313-11	TRANSFORMER, POWER (E, EA, MY, SP, HK, TH)	
⚠T901	1-429-314-11	TRANSFORMER, POWER (AEP, UK, G, IT)	

SECTION 5
ELECTRICAL PARTS LIST

AC **AMP**

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- CAPACITORS
  uF : μF
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- COILS
  uH : μH
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  HK : Hong Kong model
  SP : Singapore model
  MY : Malaysia model
  TH : Thailand model

Ref.No.	Part No.	Description			Remark
*	1-658-314-21	AC BOARD			
		********			
	1-533-223-11	HOLDER, FUSE			
		< CONNECTOR >			
CN901	1-564-321-00	PIN, CONNECTOR 2P			
CN902	1-770-011-41	CONNECTOR, BOARD TO BOARD 4P			
		< FUSE >			
⚠F901	1-532-259-00	FUSE, TIME LAG (1.6A, 250V)			
⚠F902	1-532-237-00	FUSE, TIME LAG (3.15A, 250V)			(E, EA, MY, SP, HK)
		< SWITCH >			
⚠S901	1-572-675-11	SWITCH, POWER VOLTAGE CHANGE (VOLTAGE SELECTOR)			(E, EA, MY, SP, HK)
***					
*	A-4378-841-A	AMP BOARD, COMPLETE (AEP, G, IT, UK)			
		********************************			
*	A-4378-832-A	AMP BOARD, COMPLETE (E, EA, MY, SP, HK, TH)			
		************************************			
		< CAPACITOR >			
C601	1-124-443-00	ELECT	100uF	20%	10V
C602	1-124-907-11	ELECT	10uF	20%	50V
C603	1-162-294-31	CERAMIC	0.001uF	10%	50V
C604	1-164-159-11	CERAMIC	0.1uF		50V
C701	1-126-961-11	ELECT	2.2uF	20%	50V
C702	1-162-282-31	CERAMIC	100PF	10%	50V
C703	1-124-910-11	ELECT	47uF	20%	50V
C704	1-126-965-11	ELECT	22uF	20%	50V
C706	1-126-965-11	ELECT	22uF	20%	50V
C707	1-164-159-11	CERAMIC	0.1uF		50V
C708	1-164-159-11	CERAMIC	0.1uF		50V
C709	1-126-965-11	ELECT	22uF	20%	50V
C751	1-126-961-11	ELECT	2.2uF	20%	50V
C752	1-162-282-31	CERAMIC	100PF	10%	50V
C753	1-124-910-11	ELECT	47uF	20%	50V
C754	1-126-965-11	ELECT	22uF	20%	50V
C757	1-164-159-11	CERAMIC	0.1uF		50V

Ref.No.	Part No.	Description			Remark
C758	1-164-159-11	CERAMIC	0.1uF		50V
C759	1-126-965-11	ELECT	22uF	20%	50V
C801	1-126-961-11	ELECT	2.2uF	20%	50V
C802	1-164-070-11	CERAMIC	100PF	5%	50V
C803	1-124-910-11	ELECT	47uF	20%	50V
C804	1-124-910-11	ELECT	47uF	20%	50V
C805	1-124-122-11	ELECT	100uF	20%	50V
C806	1-126-965-11	ELECT	22uF	20%	50V
C807	1-136-165-00	FILM	0.1uF	5%	50V
C808	1-136-165-00	FILM	0.1uF	5%	50V
C809	1-126-965-11	ELECT	22uF	20%	50V
C851	1-126-961-11	ELECT	2.2uF	20%	50V
C852	1-164-070-11	CERAMIC	100PF	5%	50V
C853	1-124-910-11	ELECT	47uF	20%	50V
C854	1-124-910-11	ELECT	47uF	20%	50V
C855	1-124-122-11	ELECT	100uF	20%	50V
C857	1-136-165-00	FILM	0.1uF	5%	50V
C858	1-136-165-00	FILM	0.1uF	5%	50V
C859	1-126-965-11	ELECT	22uF	20%	50V
		< CONNECTOR >			
* CN801	1-568-830-11	SOCKET, CONNECTOR 11P			
CN803	1-770-965-11	PIN, CONNECTOR (PCB) (V TYPE) 5P			
CN805	1-764-329-11	PIN, CONNECTOR (PCB) (V TYPE) 6P			
		< DIODE >			
D601	8-719-987-63	DIODE	1N4148M		
D602	8-719-987-63	DIODE	1N4148M		
D603	8-719-987-63	DIODE	1N4148M		
D701	8-719-987-63	DIODE	1N4148M		
D702	8-719-987-63	DIODE	1N4148M		
D751	8-719-987-63	DIODE	1N4148M		
D801	8-719-987-63	DIODE	1N4148M		
D802	8-719-987-63	DIODE	1N4148M		
D851	8-719-987-63	DIODE	1N4148M		
		< IC >			
IC701	8-749-920-13	IC	STK-4132MK2		
IC801	8-749-900-24	IC	STK-4162MK2		
		< TRANSISTOR >			
Q601	8-729-900-63	TRANSISTOR	DTA124ES		

AMP

Ref. No.	Part No.	Description	Remark
Q602	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q603	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q605	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q606	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q607	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q701	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA	
Q751	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA	
Q801	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA	
Q841	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q842	8-729-900-36	TRANSISTOR DTC124ES	
Q851	8-729-140-84	TRANSISTOR 2SC1841-PAFAEA	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
⚠R600	1-212-857-00	FUSIBLE 10 5% 1/4W	F
R602	1-249-441-11	CARBON 100K 5% 1/4W	
R603	1-249-441-11	CARBON 100K 5% 1/4W	
R604	1-249-429-11	CARBON 10K 5% 1/4W	
R605	1-249-425-11	CARBON 4.7K 5% 1/4W	
R606	1-249-441-11	CARBON 100K 5% 1/4W	
R607	1-249-425-11	CARBON 4.7K 5% 1/4W	
R608	1-249-441-11	CARBON 100K 5% 1/4W	
R701	1-249-417-11	CARBON 1K 5% 1/4W	
R702	1-249-438-11	CARBON 56K 5% 1/4W	
R703	1-249-411-11	CARBON 330 5% 1/4W	
R704	1-249-438-11	CARBON 56K 5% 1/4W	
R705	1-260-103-11	CARBON 2.2K 5% 1/2W	
R706	1-260-103-11	CARBON 2.2K 5% 1/2W	
⚠R708	1-217-151-00	RES, METAL PLATE 0.22	F
R709	1-260-076-11	CARBON 10 5% 1/2W	
⚠R710	1-212-857-00	FUSIBLE 10 5% 1/4W	F
R711	1-249-417-11	CARBON 1K 5% 1/4W	
R712	1-249-431-11	CARBON 15K 5% 1/4W	
R713	1-249-441-11	CARBON 100K 5% 1/4W	
R714	1-260-099-11	CARBON 1K 5% 1/2W	
R716	1-260-099-11	CARBON 1K 5% 1/2W	
R718	1-249-437-11	CARBON 47K 5% 1/4W	
R721	1-249-441-11	CARBON 100K 5% 1/4W	
R722	1-249-441-11	CARBON 100K 5% 1/4W	
R751	1-249-417-11	CARBON 1K 5% 1/4W	
R752	1-249-438-11	CARBON 56K 5% 1/4W	
R753	1-249-411-11	CARBON 330 5% 1/4W	
R754	1-249-438-11	CARBON 56K 5% 1/4W	
R755	1-260-103-11	CARBON 2.2K 5% 1/2W	
R756	1-260-103-11	CARBON 2.2K 5% 1/2W	
⚠R758	1-217-151-00	RES, METAL PLATE 0.22	F
R759	1-260-076-11	CARBON 10 5% 1/2W	
R761	1-249-417-11	CARBON 1K 5% 1/4W	
R762	1-249-431-11	CARBON 15K 5% 1/4W	
R763	1-249-441-11	CARBON 100K 5% 1/4W	
R768	1-249-438-11	CARBON 56K 5% 1/4W	
R801	1-249-417-11	CARBON 1K 5% 1/4W	
R802	1-249-438-11	CARBON 56K 5% 1/4W	
R803	1-249-415-11	CARBON 680 5% 1/4W	
R804	1-249-438-11	CARBON 56K 5% 1/4W	
R805	1-260-103-11	CARBON 2.2K 5% 1/2W	
R806	1-260-103-11	CARBON 2.2K 5% 1/2W	
⚠R807	1-212-881-11	FUSIBLE 100 5% 1/4W	F
⚠R808	1-217-151-00	RES, METAL PLATE 0.22	F
R809	1-260-076-11	CARBON 10 5% 1/2W	
⚠R810	1-212-857-00	FUSIBLE 10 5% 1/4W	F
R811	1-249-417-11	CARBON 1K 5% 1/4W	
R812	1-249-431-11	CARBON 15K 5% 1/4W	
R813	1-249-441-11	CARBON 100K 5% 1/4W	
R814	1-260-103-11	CARBON 2.2K 5% 1/2W	
R815	1-260-103-11	CARBON 2.2K 5% 1/2W	
R816	1-260-103-11	CARBON 2.2K 5% 1/2W	
R817	1-260-103-11	CARBON 2.2K 5% 1/2W	
R818	1-249-437-11	CARBON 47K 5% 1/4W	
R821	1-249-441-11	CARBON 100K 5% 1/4W	
R841	1-249-434-11	CARBON 27K 5% 1/4W	
R842	1-249-441-11	CARBON 100K 5% 1/4W	
R843	1-249-441-11	CARBON 100K 5% 1/4W	
R851	1-249-417-11	CARBON 1K 5% 1/4W	
R852	1-249-438-11	CARBON 56K 5% 1/4W	
R853	1-249-415-11	CARBON 680 5% 1/4W	
R854	1-249-438-11	CARBON 56K 5% 1/4W	
R855	1-260-103-11	CARBON 2.2K 5% 1/2W	
R856	1-260-103-11	CARBON 2.2K 5% 1/2W	
⚠R857	1-212-881-11	FUSIBLE 100 5% 1/4W	F
⚠R858	1-217-151-00	RES, METAL PLATE 0.22	F
R859	1-260-076-11	CARBON 10 5% 1/2W	
R861	1-249-417-11	CARBON 1K 5% 1/4W	
R862	1-249-431-11	CARBON 15K 5% 1/4W	
R863	1-249-441-11	CARBON 100K 5% 1/4W	
R868	1-249-438-11	CARBON 56K 5% 1/4W	

< RELAY >

Ref. No.	Part No.	Description	Remark
RY701	1-515-920-11	RELAY (24V)	
RY801	1-515-920-11	RELAY (24V)	

< THERMISTOR >

Ref. No.	Part No.	Description	Remark
TH801	1-807-796-11	THERMISTOR	

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The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref.No.	Part No.	Description			Remark
*	A-4378-846-A	AUDIO BOARD, COMPLETE (AEP, G, IT, UK) ************************************			
*	A-4378-835-A	AUDIO BOARD, COMPLETE (E, EA, MY, SP, HK, TH) ***			
		< CAPACITOR >			
C201	1-164-070-11	CERAMIC	100PF	5%	50V
C202	1-124-907-11	ELECT	10uF	20%	50V
C212	1-124-907-11	ELECT	10uF	20%	50V
C225	1-115-499-91	ELECT	220uF	20%	10V
C227	1-164-159-11	CERAMIC	0.1uF		50V
C242	1-162-282-31	CERAMIC	100PF	10%	50V (E, EA, MY, SP, HK, TH)
C243	1-162-600-11	CERAMIC	0.0047uF	20%	16V (E, EA, MY, SP, HK, TH)
C244	1-124-907-11	ELECT	10uF	20%	50V (E, EA, MY, SP, HK, TH)
C246	1-162-282-31	CERAMIC	100PF	10%	50V (E, EA, MY, SP, HK, TH)
C251	1-164-070-11	CERAMIC	100PF	5%	50V
C252	1-124-907-11	ELECT	10uF	20%	50V
C275	1-115-499-91	ELECT	220uF	20%	10V
C277	1-164-159-11	CERAMIC	0.1uF		50V
C300	1-162-286-31	CERAMIC	220PF	10%	50V
C301	1-124-443-00	ELECT	100uF	20%	10V
C302	1-104-666-11	ELECT	220uF	20%	10V
C303	1-136-159-00	FILM	0.033uF	5%	50V
C304	1-130-473-00	MYLAR	0.0015uF	5%	50V
C305	1-136-159-00	FILM	0.033uF	5%	50V
C306	1-124-903-11	ELECT	1uF	20%	50V
C307	1-124-907-11	ELECT	10uF	20%	50V
C308	1-124-907-11	ELECT	10uF	20%	50V
C309	1-124-907-11	ELECT	10uF	20%	50V
C310	1-164-159-11	CERAMIC	0.1uF		50V
C311	1-126-961-11	ELECT	2.2uF	20%	50V
C312	1-164-159-11	CERAMIC	0.1uF		50V
C313	1-136-159-00	FILM	0.033uF	5%	50V
C314	1-124-907-11	ELECT	10uF	20%	50V
C321	1-162-292-31	CERAMIC	680PF	10%	50V
C322	1-124-907-11	ELECT	10uF	20%	50V
C323	1-136-173-00	FILM	0.47uF	5%	50V
C324	1-124-477-11	ELECT	47uF	20%	25V
C325	1-136-165-00	FILM	0.1uF	5%	50V
C326	1-136-165-00	FILM	0.1uF	5%	50V
C327	1-124-465-00	ELECT	0.47uF	20%	50V
C328	1-126-963-11	ELECT	4.7uF	20%	50V
C329	1-124-465-00	ELECT	0.47uF	20%	50V
C330	1-126-963-11	ELECT	4.7uF	20%	50V
C331	1-124-250-11	ELECT	0.15uF	20%	50V
C332	1-126-962-11	ELECT	3.3uF	20%	50V
C333	1-124-250-11	ELECT	0.15uF	20%	50V
C334	1-136-157-00	FILM	0.022uF	5%	50V
C335	1-136-161-00	FILM	0.047uF	5%	50V
C336	1-104-666-11	ELECT	220uF	20%	10V
C337	1-124-907-11	ELECT	10uF	20%	50V
C338	1-124-907-11	ELECT	10uF	20%	50V
C339	1-124-907-11	ELECT	10uF	20%	50V
C340	1-124-907-11	ELECT	10uF	20%	50V
C341	1-104-666-11	ELECT	220uF	20%	10V
C342	1-124-907-11	ELECT	10uF	20%	50V
C343	1-124-907-11	ELECT	10uF	20%	50V
C344	1-136-165-00	FILM	0.1uF	5%	50V
C345	1-136-165-00	FILM	0.1uF	5%	50V
C346	1-124-465-00	ELECT	0.47uF	20%	50V
C347	1-126-963-11	ELECT	4.7uF	20%	50V
C348	1-124-465-00	ELECT	0.47uF	20%	50V
C349	1-126-963-11	ELECT	4.7uF	20%	50V
C350	1-124-250-11	ELECT	0.15uF	20%	50V
C351	1-126-962-11	ELECT	3.3uF	20%	50V
C352	1-124-250-11	ELECT	0.15uF	20%	50V
C353	1-124-443-00	ELECT	100uF	20%	10V
		< CONNECTOR >			
CN201	1-770-728-11	CONNECTOR, BOARD TO BOARD 9P			
CN202	1-770-731-11	CONNECTOR, BOARD TO BOARD 12P			
* CN203	1-568-834-11	SOCKET, CONNECTOR 15P			
CN204	1-568-860-11	SOCKET, CONNECTOR 17P			
* CN205	1-568-854-11	SOCKET, CONNECTOR 11P			
		< DIODE >			
D202	8-719-987-63	DIODE 1N4148M			
		< IC >			
IC201	8-759-910-83	IC TL072ACP			
IC211	8-759-000-48	IC MC14052BCP			
IC221	8-759-910-83	IC TL072ACP			
IC241	8-759-634-51	IC M5218AP (E, EA, MY, SP, HK, TH)			
IC301	8-759-168-98	IC LV1010N			
IC302	8-759-248-74	IC LA2785			
		< TRANSISTOR >			
Q201	8-729-900-63	TRANSISTOR DTA124ES			
Q212	8-729-900-63	TRANSISTOR DTA124ES			
Q241	8-729-141-30	TRANSISTOR 2SC3623A-LK(E, EA, MY, SP, HK, T			
Q242	8-729-900-63	TRANSISTOR DTA124ES (E, EA, MY, SP, HK, TH)			
Q243	8-729-900-63	TRANSISTOR DTA124ES (E, EA, MY, SP, HK, TH)			
		< RESISTOR >			
R200	1-249-417-11	CARBON	1K	5%	1/4W
R201	1-249-429-11	CARBON	10K	5%	1/4W

AUDIO COVER FL

Ref. No.	Part No.	Description	Remark
R202	1-249-430-11	CARBON 12K 5% 1/4W	
R203	1-249-429-11	CARBON 10K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R204	1-249-430-11	CARBON 12K 5% 1/4W	
R205	1-249-429-11	CARBON 10K 5% 1/4W	(AEP, G, IT, UK)
R211	1-249-441-11	CARBON 100K 5% 1/4W	
R212	1-249-417-11	CARBON 1K 5% 1/4W	
R213	1-249-417-11	CARBON 1K 5% 1/4W	
R214	1-249-441-11	CARBON 100K 5% 1/4W	
R215	1-249-429-11	CARBON 10K 5% 1/4W	
R216	1-249-417-11	CARBON 1K 5% 1/4W	
R217	1-249-421-11	CARBON 2.2K 5% 1/4W	
R218	1-249-429-11	CARBON 10K 5% 1/4W	
R220	1-249-417-11	CARBON 1K 5% 1/4W	
R221	1-247-903-00	CARBON 1M 5% 1/4W	
R222	1-249-419-11	CARBON 1.5K 5% 1/4W	
R223	1-249-429-11	CARBON 10K 5% 1/4W	
R225	1-249-399-11	CARBON 33 5% 1/4W	
R227	1-249-429-11	CARBON 10K 5% 1/4W	
R241	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R242	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R243	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R244	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R245	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R246	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R247	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R251	1-249-429-11	CARBON 10K 5% 1/4W	
R252	1-249-430-11	CARBON 12K 5% 1/4W	
R253	1-249-429-11	CARBON 10K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R254	1-249-430-11	CARBON 12K 5% 1/4W	
R255	1-249-429-11	CARBON 10K 5% 1/4W	(AEP, G, IT, UK)
R270	1-249-417-11	CARBON 1K 5% 1/4W	
R271	1-247-903-00	CARBON 1M 5% 1/4W	
R272	1-249-419-11	CARBON 1,5K 5% 1/4W	
R273	1-249-429-11	CARBON 10K 5% 1/4W	
R275	1-249-399-11	CARBON 33 5% 1/4W	
R277	1-249-429-11	CARBON 10K 5% 1/4W	
R291	1-249-429-11	CARBON 10K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R292	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)

Ref. No.	Part No.	Description	Remark
R293	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R294	1-249-417-11	CARBON 1K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R300	1-247-903-00	CARBON 1M 5% 1/4W	
R301	1-249-411-11	CARBON 330 5% 1/4W	
R302	1-249-436-11	CARBON 39K 5% 1/4W	
R303	1-249-436-11	CARBON 39K 5% 1/4W	
R304	1-249-432-11	CARBON 18K 5% 1/4W	
R305	1-249-417-11	CARBON 1K 5% 1/4W	
R306	1-249-417-11	CARBON 1K 5% 1/4W	
R307	1-249-389-11	CARBON 4.7 5% 1/4W	
R308	1-249-411-11	CARBON 330 5% 1/4W	
R309	1-249-411-11	CARBON 330 5% 1/4W	
R310	1-249-418-11	CARBON 1.2K 5% 1/4W	
R311	1-249-418-11	CARBON 1.2K 5% 1/4W	
R312	1-249-417-11	CARBON 1K 5% 1/4W	
R351	1-249-417-11	CARBON 1K 5% 1/4W	
R352	1-249-417-11	CARBON 1K 5% 1/4W	
R353	1-249-417-11	CARBON 1K 5% 1/4W	

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X301	1-579-125-11	VIBRATOR, CERAMIC (8MHz)	

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* 1-658-316-21 COVER BOARD

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< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN903	1-770-010-21	CONNECTOR, BOARD TO BOARD 4P	
CN905	1-770-010-21	CONNECTOR, BOARD TO BOARD 4P	

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* 1-658-310-21 FL BOARD

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* 4-979-799-01 HOLDER (FL)

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C551	1-162-282-31	CERAMIC 100PF 10% 50V	
C556	1-164-159-11	CERAMIC 0.1uF 50V	
C557	1-164-159-11	CERAMIC 0.1uF 50V	

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN551	1-562-088-00	SOCKET, CONNECTOR 9P	

< FLUORESCENT INDICATOR >

Ref. No.	Part No.	Description	Remark
FL501	1-517-367-11	INDICATOR TUBE, FLUORESCENT	

Ref.No.	Part No.	Description			Remark
		< IC >			
IC551	8-759-261-63	IC M66004M6FP (R)			
		< RESISTOR >			
R551	1-249-434-11	CARBON	27K	5%	1/4W
R555	1-249-417-11	CARBON	1K	5%	1/4W
R556	1-249-417-11	CARBON	1K	5%	1/4W
R557	1-249-417-11	CARBON	1K	5%	1/4W
R558	1-249-417-11	CARBON	1K	5%	1/4W
**					
*	1-658-311-21	H.P BOARD *********			
		< CAPACITOR >			
C491	1-162-306-11	CERAMIC	0.01uF	30%	16V
C492	1-162-306-11	CERAMIC	0.01uF	30%	16V
C493	1-164-159-11	CERAMIC	0.1uF		50V
C494	1-164-159-11	CERAMIC	0.1uF		50V (E, EA, MY, SP, HK, TH)
		< CONNECTOR >			
* CN511	1-568-828-11	SOCKET, CONNECTOR 9P			
		< JACK >			
J401	1-770-226-11	JACK (LARGE TYPE) (PHONES)			
J402	1-770-226-11	JACK (LARGE TYPE) (MIX MIC)			(E, EA, MY, SP, HK, TH)
**					
*	A-4378-845-A	MAIN BOARD, COMPLETE (AEP, G, IT, UK) *********************************			
*	A-4378-834-A	MAIN BOARD, COMPLETE (E, EA, MY, SP, HK, TH) ************************************			
	1-533-223-11	HOLDER, FUSE			
*	3-309-144-21	HEAT SINK			
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S			
		< CAPACITOR >			
C191	1-124-442-00	ELECT	330uF	20%	6.3V
C621	1-126-963-11	ELECT	4.7uF	20%	50V
C901	1-126-138-11	ELECT	4700uF	20%	50V
C902	1-126-138-11	ELECT	4700uF	20%	50V
C903	1-136-165-00	FILM	0.1uF	5%	50V
C904	1-136-165-00	FILM	0.1uF	5%	50V
C911	1-124-618-11	ELECT	2200uF	20%	35V
C912	1-124-618-11	ELECT	2200uF	20%	35V
C913	1-136-165-00	FILM	0.1uF	5%	50V
C914	1-136-165-00	FILM	0.1uF	5%	50V

Ref.No.	Part No.	Description			Remark
C915	1-126-972-11	ELECT	1000uF	20%	35V
C916	1-126-972-11	ELECT	1000uF	20%	35V
C917	1-164-159-11	CERAMIC	0.1uF		50V
C918	1-164-159-11	CERAMIC	0.1uF		50V
C919	1-124-472-11	ELECT	470uF	20%	10V
C920	1-124-472-11	ELECT	470uF	20%	10V
C921	1-124-122-11	ELECT	100uF	20%	50V
C922	1-164-159-11	CERAMIC	0.1uF		50V
C923	1-124-472-11	ELECT	470uF	20%	10V
C951	1-136-153-00	FILM	0.01uF	5%	50V
C952	1-136-153-00	FILM	0.01uF	5%	50V
C953	1-126-942-61	ELECT	1000uF	20%	16V
C954	1-164-159-11	CERAMIC	0.1uF		50V
C955	1-124-442-00	ELECT	330uF	20%	6.3V
C961	1-124-122-11	ELECT	100uF	20%	50V
C962	1-124-122-11	ELECT	100uF	20%	50V
C963	1-124-907-11	ELECT	10uF	20%	50V
C964	1-124-907-11	ELECT	10uF	20%	50V
C971	1-124-122-11	ELECT	100uF	20%	50V
C972	1-124-122-11	ELECT	100uF	20%	50V
		< CONNECTOR >			
CN101	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)			
CN102	1-770-724-11	CONNECTOR, BOARD TO BOARD 9P			
* CN103	1-770-747-11	CONNECTOR, BOARD TO BOARD 12P			
* CN104	1-568-824-11	SOCKET, CONNECTOR 5P			
* CN105	1-568-839-11	SOCKET, CONNECTOR 23P			
CN106	1-764-327-11	PIN, CONNECTOR (PCB)(V TYPE)4P			
CN107	1-764-328-61	PIN, CONNECTOR (PCB)(V TYPE)5P			
CN108	1-770-965-21	PIN, CONNECTOR (PCB)(V TYPE)5P			
CN109	1-770-966-11	PIN, CONNECTOR (PCB)(V TYPE)6P			
		< DIODE >			
D191	8-719-024-99	DIODE 11ES2-NTA2B			
D611	8-719-987-63	DIODE 1N4148M			
D621	8-719-987-63	DIODE 1N4148M			
D622	8-719-987-63	DIODE 1N4148M			
D623	8-719-987-63	DIODE 1N4148M			
D624	8-719-987-63	DIODE 1N4148M			
D901	8-719-510-68	DIODE D5SBA20F01			
D911	8-719-025-03	DIODE RBA-402-SL			
D951	8-719-024-99	DIODE 11ES2-NTA2B			
D952	8-719-024-99	DIODE 11ES2-NTA2B			
D961	8-719-024-99	DIODE 11ES2-NTA2B			
D962	8-719-024-99	DIODE 11ES2-NTA2B			
D963	8-719-934-23	DIODE HZS30-3L			
		< FUSE >			
⚠F911	1-532-203-00	FUSE, TIME LAG (2A, 250V)			
⚠F912	1-532-203-00	FUSE, TIME LAG (2A, 250V)			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MAIN PANEL

Ref. No.	Part No.	Description				Remark
		< IC >				
IC101	8-759-000-47	IC MC14051BCP				
IC102	8-759-000-47	IC MC14051BCP				
IC103	8-759-000-48	IC MC14052BCP				
IC191	8-759-962-08	IC BA6208				
IC911	8-759-231-55	IC TA7808S				
IC912	8-759-245-81	IC TA79008S				
IC913	8-759-231-57	IC TA7810S				
IC951	8-759-158-62	IC TA78057S				
		< IC LINK >				
⚠ICP911	1-532-986-31	LINK, IC (10A)				
⚠ICP912	1-532-986-31	LINK, IC (10A)				
		< JACK >				
J101	1-770-015-11	JACK, PIN 6P(TUNER IN,CD IN,MD/DAT OUT)				
J102	1-770-015-11	JACK, PIN6P(MD/DAT IN,TAPE OUT,TAPE IN)				
J103	1-770-015-11	JACK, PIN 6P (VIDEO2 IN,VIDEO1 OUT,VIDEO1 IN)				
		< TRANSISTOR >				
Q611	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q621	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q622	8-729-900-36	TRANSISTOR DTC124ES				
Q926	8-729-119-76	TRANSISTOR 2SA1175-HFE				
Q961	8-729-118-00	TRANSISTOR 2SB1116-L				
		< RESISTOR >				
R101	1-249-417-11	CARBON	1K	5%	1/4W	
R102	1-249-425-11	CARBON	4.7K	5%	1/4W	
R103	1-249-417-11	CARBON	1K	5%	1/4W	
R104	1-249-425-11	CARBON	4.7K	5%	1/4W	
R105	1-249-417-11	CARBON	1K	5%	1/4W	
R106	1-249-417-11	CARBON	1K	5%	1/4W	
R107	1-249-417-11	CARBON	1K	5%	1/4W	
R108	1-249-417-11	CARBON	1K	5%	1/4W	
R109	1-249-417-11	CARBON	1K	5%	1/4W	
R112	1-249-429-11	CARBON	10K	5%	1/4W	
R113	1-249-429-11	CARBON	10K	5%	1/4W	
R117	1-249-417-11	CARBON	1K	5%	1/4W	
R118	1-249-417-11	CARBON	1K	5%	1/4W	
R119	1-249-417-11	CARBON	1K	5%	1/4W	
R121	1-249-441-11	CARBON	100K	5%	1/4W	
R122	1-249-441-11	CARBON	100K	5%	1/4W	
R123	1-249-441-11	CARBON	100K	5%	1/4W	
R124	1-249-417-11	CARBON	1K	5%	1/4W	
R125	1-249-417-11	CARBON	1K	5%	1/4W	
R126	1-249-417-11	CARBON	1K	5%	1/4W	
R151	1-249-417-11	CARBON	1K	5%	1/4W	
R152	1-249-425-11	CARBON	4.7K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R153	1-249-417-11	CARBON	1K	5%	1/4W	
R154	1-249-425-11	CARBON	4.7K	5%	1/4W	
R155	1-249-417-11	CARBON	1K	5%	1/4W	
R156	1-249-417-11	CARBON	1K	5%	1/4W	
R157	1-249-417-11	CARBON	1K	5%	1/4W	
R158	1-249-417-11	CARBON	1K	5%	1/4W	
R159	1-249-417-11	CARBON	1K	5%	1/4W	
R162	1-249-429-11	CARBON	10K	5%	1/4W	
R163	1-249-429-11	CARBON	10K	5%	1/4W	
R167	1-249-417-11	CARBON	1K	5%	1/4W	
R168	1-249-417-11	CARBON	1K	5%	1/4W	
R169	1-249-417-11	CARBON	1K	5%	1/4W	
R611	1-249-417-11	CARBON	1K	5%	1/4W	
R621	1-249-429-11	CARBON	10K	5%	1/4W	
R622	1-249-429-11	CARBON	10K	5%	1/4W	
R623	1-249-429-11	CARBON	10K	5%	1/4W	
R624	1-249-429-11	CARBON	10K	5%	1/4W	
R625	1-249-441-11	CARBON	100K	5%	1/4W	
⚠R911	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R913	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R915	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R916	1-212-881-11	FUSIBLE	100	5%	1/4W	F
⚠R951	1-212-857-00	FUSIBLE	10	5%	1/4W	F
R961	1-249-429-11	CARBON	10K	5%	1/4W	
R962	1-249-397-11	CARBON	22	5%	1/4W	
R971	1-249-413-11	CARBON	470	5%	1/4W	
R972	1-249-413-11	CARBON	470	5%	1/4W	
R973	1-249-413-11	CARBON	470	5%	1/4W	
R974	1-249-413-11	CARBON	470	5%	1/4W	
R975	1-249-413-11	CARBON	470	5%	1/4W	
R976	1-249-413-11	CARBON	470	5%	1/4W	
R977	1-249-413-11	CARBON	470	5%	1/4W	
R978	1-249-413-11	CARBON	470	5%	1/4W	
R1191	1-249-417-11	CARBON	1K	5%	1/4W	
R1193	1-249-417-11	CARBON	1K	5%	1/4W	

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* A-4378-837-A PANEL BOARD, COMPLETE (AEP,G,IT,UK)
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* A-4378-829-A PANEL BOARD, COMPLETE (E,EA,MY,SP,HK,TH)
****

Ref. No.	Part No.	Description				Remark
		< CAPACITOR >				
C400	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C401	1-136-157-00	FILM	0.022uF	5%	50V	
C402	1-136-163-00	FILM	0.068uF	5%	50V	
C403	1-136-167-00	FILM	0.15uF	5%	50V	
C404	1-136-173-00	FILM	0.47uF	5%	50V	
C411	1-124-907-11	ELECT	10uF	20%	50V	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
C414	1-124-907-11	ELECT	10uF	20%	50V	
C431	1-162-294-31	CERAMIC	0.001uF	10%	50V	(E, EA, MY, SP, HK, TH)
C432	1-126-301-11	ELECT	1uF	20%	50V	(E, EA, MY, SP, HK, TH)
C433	1-162-282-31	CERAMIC	100PF	10%	50V	(E, EA, MY, SP, HK, TH)
C434	1-162-282-31	CERAMIC	100PF	10%	50V	(E, EA, MY, SP, HK, TH)
C435	1-126-301-11	ELECT	1uF	20%	50V	(E, EA, MY, SP, HK, TH)
C436	1-162-282-31	CERAMIC	100PF	10%	50V	(E, EA, MY, SP, HK, TH)
C437	1-164-159-11	CERAMIC	0.1uF		50V	(E, EA, MY, SP, HK, TH)
C438	1-164-159-11	CERAMIC	0.1uF		50V	(E, EA, MY, SP, HK, TH)
C439	1-162-282-31	CERAMIC	100PF	10%	50V	(E, EA, MY, SP, HK, TH)
C440	1-162-282-31	CERAMIC	100PF	10%	50V	(E, EA, MY, SP, HK, TH)
C441	1-126-301-11	ELECT	1uF	20%	50V	(E, EA, MY, SP, HK, TH)
C442	1-124-443-00	ELECT	100uF	20%	10V	(E, EA, MY, SP, HK, TH)
C443	1-124-443-00	ELECT	100uF	20%	10V	(E, EA, MY, SP, HK, TH)
C450	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C451	1-136-157-00	FILM	0.022uF	5%	50V	
C452	1-136-163-00	FILM	0.068uF	5%	50V	
C453	1-136-167-00	FILM	0.15uF	5%	50V	
C454	1-136-173-00	FILM	0.47uF	5%	50V	
C461	1-124-907-11	ELECT	10uF	20%	50V	
C464	1-124-907-11	ELECT	10uF	20%	50V	
C501	1-164-159-11	CERAMIC	0.1uF		50V	
C502	1-124-442-00	ELECT	330uF	20%	6.3V	
C503	1-164-159-11	CERAMIC	0.1uF		50V	
C504	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C505	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C506	1-124-443-00	ELECT	100uF	20%	10V	
C507	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C508	1-162-306-11	CERAMIC	0.01uF	30%	16V	
C509	1-162-306-11	CERAMIC	0.01uF	30%	16V	(E, EA, MY, SP, HK, TH)
C510	1-162-286-31	CERAMIC	220PF	10%	50V	
C511	1-162-306-11	CERAMIC	0.01uF	30%	16V	(E, EA, MY, SP, HK, TH)
C552	1-164-159-11	CERAMIC	0.1uF		50V	
C553	1-164-159-11	CERAMIC	0.1uF		50V	
C554	1-164-159-11	CERAMIC	0.1uF		50V	
C555	1-164-159-11	CERAMIC	0.1uF		50V	

Ref. No.	Part No.	Description	Remark
		< CONNECTOR >	
* CN501	1-568-839-11	SOCKET, CONNECTOR 23P	
* CN502	1-568-834-11	SOCKET, CONNECTOR 15P	
CN503	1-573-379-11	PIN, CONNECTOR 9P	
* CN504	1-568-828-11	SOCKET, CONNECTOR 9P	
		< DIODE >	
D501	8-719-987-63	DIODE 1N4148M	
D502	8-719-024-99	DIODE 11ES2-NTA2B	
D504	8-719-987-63	DIODE 1N4148M	
D505	8-719-987-63	DIODE 1N4148M	
D506	8-719-987-63	DIODE 1N4148M	
D507	8-719-987-63	DIODE 1N4148M	(E, EA, MY, SP, HK, TH)
D531	8-719-046-44	DIODE SEL5221S (ON/STANDBY)	
D532	8-719-046-70	DIODE SEL5620C (STADIUM)	
D533	8-719-046-70	DIODE SEL5620C (LIVE)	
D534	8-719-046-70	DIODE SEL5620C (DANCE)	
D535	8-719-046-70	DIODE SEL5620C (HALL)	
D536	8-719-046-70	DIODE SEL5620C (PHANTOM)	
D537	8-719-046-70	DIODE SEL5620C (NORMAL)	
D538	8-719-046-70	DIODE SEL5620C (WIDE)	
D539	8-719-046-70	DIODE SEL5620C (3CH LOGIC)	
D540	8-719-301-49	DIODE SEL2810A (DSP MODE)	
D541	8-719-301-49	DIODE SEL2810A (DOLBY SURROUND)	
D542	8-719-046-44	DIODE SEL5221S (SOURCE DIRECT)	
D543	8-719-046-44	DIODE SEL5221S (-20dB MUTING)	
D544	8-719-046-44	DIODE SEL5221S (KARAOKE PON)	(E, EA, MY, SP, HK, TH)
D551	8-719-010-33	DIODE UZ-4.7BSB	
		< IC >	
IC401	8-759-634-50	IC M5218AL	
IC431	8-759-634-50	IC M5218AL	(E, EA, MY, SP, HK, TH)
IC501	8-759-386-86	IC M37471M4-S3	
IC502	8-759-165-80	IC PST600C-T	
IC503	8-759-917-43	IC SN74HC138AN	
IC504	8-749-920-83	IC GP1U52XB (R)	
		< TRANSISTOR >	
Q501	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q531	8-729-900-63	TRANSISTOR DTA124ES	
Q532	8-729-900-36	TRANSISTOR DTC124ES	
Q533	8-729-900-36	TRANSISTOR DTC124ES	
Q534	8-729-900-36	TRANSISTOR DTC124ES	
Q535	8-729-900-36	TRANSISTOR DTC124ES	
Q536	8-729-900-36	TRANSISTOR DTC124ES	(E, EA, MY, SP, HK, TH)
Q537	8-729-900-36	TRANSISTOR DTC124ES	
Q538	8-729-900-36	TRANSISTOR DTC124ES	
Q539	8-729-900-36	TRANSISTOR DTC124ES	

PANEL

Ref. No.	Part No.	Description	Remark
		< RESISTOR >	
R402	1-249-409-11	CARBON 220 5% 1/4W	
R403	1-249-423-11	CARBON 3.3K 5% 1/4W	
R404	1-249-417-11	CARBON 1K 5% 1/4W	
R405	1-247-903-00	CARBON 1M 5% 1/4W	
R406	1-247-903-00	CARBON 1M 5% 1/4W	
R411	1-249-441-11	CARBON 100K 5% 1/4W	
R412	1-249-429-11	CARBON 10K 5% 1/4W	
R413	1-249-422-11	CARBON 2.7K 5% 1/4W	
R431	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R432	1-249-417-11	CARBON 1K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R433	1-249-431-11	CARBON 15K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R434	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R435	1-249-417-11	CARBON 1K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R436	1-249-435-11	CARBON 33K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R437	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R438	1-249-441-11	CARBON 100K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R439	1-249-421-11	CARBON 2.2K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R440	1-247-807-31	CARBON 100 5% 1/4W	(E, EA, MY, SP, HK, TH)
R441	1-247-807-31	CARBON 100 5% 1/4W	(E, EA, MY, SP, HK, TH)
R452	1-249-409-11	CARBON 220 5% 1/4W	
R453	1-249-423-11	CARBON 3.3K 5% 1/4W	
R454	1-249-417-11	CARBON 1K 5% 1/4W	
R455	1-247-903-00	CARBON 1M 5% 1/4W	
R456	1-247-903-00	CARBON 1M 5% 1/4W	
R461	1-249-441-11	CARBON 100K 5% 1/4W	
R462	1-249-429-11	CARBON 10K 5% 1/4W	
R463	1-249-422-11	CARBON 2.7K 5% 1/4W	
R501	1-249-429-11	CARBON 10K 5% 1/4W	
R502	1-249-429-11	CARBON 10K 5% 1/4W	
R503	1-249-429-11	CARBON 10K 5% 1/4W	
R504	1-249-417-11	CARBON 1K 5% 1/4W	
R505	1-249-441-11	CARBON 100K 5% 1/4W	
R506	1-249-417-11	CARBON 1K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R507	1-249-429-11	CARBON 10K 5% 1/4W	
R508	1-249-417-11	CARBON 1K 5% 1/4W	
R509	1-249-417-11	CARBON 1K 5% 1/4W	
R510	1-249-411-11	CARBON 330 5% 1/4W	
R511	1-249-429-11	CARBON 10K 5% 1/4W	
R512	1-249-431-11	CARBON 15K 5% 1/4W	
R513	1-249-417-11	CARBON 1K 5% 1/4W	
R514	1-249-418-11	CARBON 1.2K 5% 1/4W	
R515	1-249-418-11	CARBON 1.2K 5% 1/4W	
R516	1-249-419-11	CARBON 1.5K 5% 1/4W	
R517	1-249-427-11	CARBON 6.8K 5% 1/4W	
R518	1-249-423-11	CARBON 3.3K 5% 1/4W	(E, EA, MY, SP, HK, TH)
R522	1-249-417-11	CARBON 1K 5% 1/4W	
R523	1-249-417-11	CARBON 1K 5% 1/4W	
R531	1-249-411-11	CARBON 330 5% 1/4W	
R532	1-249-403-11	CARBON 68 5% 1/4W	
R534	1-249-411-11	CARBON 330 5% 1/4W	
R535	1-249-411-11	CARBON 330 5% 1/4W	
R536	1-249-411-11	CARBON 330 5% 1/4W	(E, EA, MY, SP, HK, TH)
R537	1-249-417-11	CARBON 1K 5% 1/4W	
R538	1-249-417-11	CARBON 1K 5% 1/4W	
R539	1-249-417-11	CARBON 1K 5% 1/4W	
R540	1-249-417-11	CARBON 1K 5% 1/4W	
R541	1-249-425-11	CARBON 4.7K 5% 1/4W	
R542	1-249-417-11	CARBON 1K 5% 1/4W	
R543	1-249-417-11	CARBON 1K 5% 1/4W	
R544	1-249-417-11	CARBON 1K 5% 1/4W	
R545	1-249-425-11	CARBON 4.7K 5% 1/4W	
R546	1-249-417-11	CARBON 1K 5% 1/4W	
R547	1-249-417-11	CARBON 1K 5% 1/4W	
R548	1-249-417-11	CARBON 1K 5% 1/4W	
R552	1-249-409-11	CARBON 220 5% 1/4W	
R553	1-249-409-11	CARBON 220 5% 1/4W	
R554	1-249-429-11	CARBON 10K 5% 1/4W	
		< VARIABLE RESISTOR >	
RV401	1-223-810-11	RES, VAR, CARBON 10K/10K (TREBLE)	
RV402	1-223-810-11	RES, VAR, CARBON 10K/10K (BASS)	
RV431	1-223-974-11	RES, VAR, CARBON 50K (MIC LEVEL)	(E, EA, MY, SP, HK, TH)
		< SWITCH >	
S501	1-554-303-21	SWITCH, TACTILE (SYSTEM POWER)	
S502	1-554-303-21	SWITCH, TACTILE (AUDIO)	
S503	1-554-303-21	SWITCH, TACTILE (VIDEO)	
S504	1-554-303-21	SWITCH, TACTILE (DSP MODE)	
S505	1-554-303-21	SWITCH, TACTILE (DOLBY SURROUND)	
S506	1-554-303-21	SWITCH, TACTILE (SOURCE DIRECT)	
S507	1-554-303-21	SWITCH, TACTILE (-20dB MUTING)	
S508	1-554-303-21	SWITCH, TACTILE (KARAOKE PON)	(E, EA, MY, SP, HK, TH)
		< VIBRATOR >	
X501	1-579-125-11	VIBRATOR, CERAMIC (8MHz)	

Ref. No.	Part No.	Description	Remark
**			
*	A-4378-847-A	SP BOARD, COMPLETE (AEP,G,IT,UK) ********************************	
*	A-4378-836-A	SP BOARD, COMPLETE (E,EA,MY,SP,HK,TH) ************************************	
		< CAPACITOR >	
C180	1-124-443-00	ELECT 100uF 20% 10V	
C181	1-124-907-11	ELECT 10uF 20% 50V	
C182	1-124-907-11	ELECT 10uF 20% 50V	
C183	1-124-907-11	ELECT 10uF 20% 50V	
C184	1-126-941-11	ELECT 470uF 20% 16V	
C185	1-126-941-11	ELECT 470uF 20% 16V	
C631	1-124-907-11	ELECT 10uF 20% 50V	
C891	1-136-153-00	FILM 0.01uF 5% 50V	(AEP,G,IT,UK)
C892	1-136-153-00	FILM 0.01uF 5% 50V	(AEP,G,IT,UK)
C893	1-136-153-00	FILM 0.01uF 5% 50V	(AEP,G,IT,UK)
C894	1-136-153-00	FILM 0.01uF 5% 50V	(AEP,G,IT,UK)
C895	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C896	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C897	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C898	1-162-306-11	CERAMIC 0.01uF 30% 16V	
		< CONNECTOR >	
* CN891	1-564-521-11	PLUG, CONNECTOR 6P	
* CN892	1-564-521-11	PLUG, CONNECTOR 6P	
* CN893	1-564-518-11	PLUG, CONNECTOR 3P	
* CN894	1-568-848-11	SOCKET, CONNECTOR 5P	
		< DIODE >	
D631	8-719-987-63	DIODE 1N4148M	
D632	8-719-987-63	DIODE 1N4148M	
D633	8-719-987-63	DIODE 1N4148M	
D634	8-719-987-63	DIODE 1N4148M	
		< IC >	
IC181	8-759-140-53	IC uPD4053BC	
		< JACK >	
J801	1-569-662-11	JACK, PIN 1P (SUPER WOOFER)	
J802	1-565-934-11	JACK, PIN 2P (VIDEO2 IN,VIDEO1 OUT)	
J803	1-565-934-11	JACK, PIN 2P (VIDEO1 IN,MONITOR OUT)	
		< COIL >	
L181	1-408-405-00	INDUCTOR 4.7uH	
L701	1-420-872-00	COIL, AIR-CORE	

Ref. No.	Part No.	Description	Remark
L751	1-420-872-00	COIL, AIR-CORE	
L801	1-420-872-00	COIL, AIR-CORE	
L851	1-420-872-00	COIL, AIR-CORE	
		< TRANSISTOR >	
Q181	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q182	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q183	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q184	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q185	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q186	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q631	8-729-900-63	TRANSISTOR DTA124ES	
Q632	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q633	8-729-118-00	TRANSISTOR 2SB1116-L	
Q634	8-729-118-00	TRANSISTOR 2SB1116-L	
		< RESISTOR >	
R181	1-247-804-11	CARBON 75 5% 1/4W	
R182	1-247-804-11	CARBON 75 5% 1/4W	
R183	1-249-409-11	CARBON 220 5% 1/4W	
R184	1-249-433-11	CARBON 22K 5% 1/4W	
R185	1-249-429-11	CARBON 10K 5% 1/4W	
R186	1-249-411-11	CARBON 330 5% 1/4W	
R187	1-249-421-11	CARBON 2.2K 5% 1/4W	
R188	1-249-418-11	CARBON 1.2K 5% 1/4W	
R189	1-249-417-11	CARBON 1K 5% 1/4W	
R190	1-249-409-11	CARBON 220 5% 1/4W	
R191	1-247-804-11	CARBON 75 5% 1/4W	
R192	1-247-804-11	CARBON 75 5% 1/4W	
R193	1-249-413-11	CARBON 470 5% 1/4W	
R194	1-249-413-11	CARBON 470 5% 1/4W	
R195	1-249-441-11	CARBON 100K 5% 1/4W	
R196	1-249-441-11	CARBON 100K 5% 1/4W	
R197	1-249-417-11	CARBON 1K 5% 1/4W	
R198	1-249-417-11	CARBON 1K 5% 1/4W	
R631	1-249-433-11	CARBON 22K 5% 1/4W	
R632	1-249-433-11	CARBON 22K 5% 1/4W	
R633	1-249-441-11	CARBON 100K 5% 1/4W	
R634	1-249-441-11	CARBON 100K 5% 1/4W	
R635	1-249-441-11	CARBON 100K 5% 1/4W	
R636	1-249-429-11	CARBON 10K 5% 1/4W	
R637	1-249-429-11	CARBON 10K 5% 1/4W	
R638	1-260-096-11	CARBON 560 5% 1/2W	
R639	1-260-096-11	CARBON 560 5% 1/2W	
R640	1-260-096-11	CARBON 560 5% 1/2W	
R641	1-260-096-11	CARBON 560 5% 1/2W	
R720	1-260-076-11	CARBON 10 5% 1/2W	
R770	1-260-076-11	CARBON 10 5% 1/2W	
R820	1-260-076-11	CARBON 10 5% 1/2W	
R821	1-249-437-11	CARBON 47K 5% 1/4W	
R841	1-249-421-11	CARBON 2.2K 5% 1/4W	

SP TRANS VOL

Ref. No.	Part No.	Description	Remark
R870	1-260-076-11	CARBON 10 5% 1/2W	
R871	1-249-437-11	CARBON 47K 5% 1/4W	
R891	1-260-076-11	CARBON 10 5% 1/2W	(AEP, G, IT, UK)
R892	1-260-076-11	CARBON 10 5% 1/2W	(AEP, G, IT, UK)
R893	1-260-076-11	CARBON 10 5% 1/2W	(AEP, G, IT, UK)
R894	1-260-076-11	CARBON 10 5% 1/2W	(AEP, G, IT, UK)
R895	1-249-437-11	CARBON 47K 5% 1/4W	
		< TERMINAL >	
TM801	1-537-822-21	TERMINAL BOARD (SP) (FRONT SPEAKER)	
TM802	1-537-336-41	TERMINAL BOARD (SP)	(REAR SPEAKER, CENTER SPEAKER)
		**	
*	1-658-315-21	TRANS BOARD ***********	
		< CONNECTOR >	
CN904	1-770-011-41	CONNECTOR, BOARD TO BOARD 4P	
CN911	1-764-327-11	PIN, CONNECTOR (PCB) (V TYPE) 4P	
CN912	1-764-328-61	PIN, CONNECTOR (PCB) (V TYPE) 5P	
		**	
*	1-658-312-21	VOL BOARD *********	
		< CAPACITOR >	
C421	1-164-159-11	CERAMIC 0.1uF	50V
		< CONNECTOR >	
* CN401	1-568-836-11	SOCKET, CONNECTOR 17P	
		< TRANSISTOR >	
Q221	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q222	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q223	8-729-141-30	TRANSISTOR 2SC3623A-LK	
Q224	8-729-141-30	TRANSISTOR 2SC3623A-LK	
		< RESISTOR >	
R421	1-249-427-11	CARBON 6.8K 5% 1/4W	
R422	1-249-415-11	CARBON 680 5% 1/4W	
R423	1-249-417-11	CARBON 1K 5% 1/4W	
R425	1-249-426-11	CARBON 5.6K 5% 1/4W	
R426	1-249-415-11	CARBON 680 5% 1/4W	
R427	1-249-417-11	CARBON 1K 5% 1/4W	

Ref. No.	Part No.	Description	Remark
R429	1-249-411-11	CARBON 330 5% 1/4W	
R471	1-249-427-11	CARBON 6.8K 5% 1/4W	
R472	1-249-415-11	CARBON 680 5% 1/4W	
R473	1-249-417-11	CARBON 1K 5% 1/4W	
R475	1-249-426-11	CARBON 5.6K 5% 1/4W	
R476	1-249-415-11	CARBON 680 5% 1/4W	
R477	1-249-417-11	CARBON 1K 5% 1/4W	
R479	1-249-441-11	CARBON 100K 5% 1/4W	
		< VARIABLE RESISTOR >	
RV403	1-223-809-11	RES, VAR, CARBON 100KX4 (VOLUME)	
		< TRANSFORMER >	
⚠T901	1-429-313-11	TRANSFORMER, POWER (E, EA, MY, SP, HK, TH)	
⚠T901	1-429-314-11	TRANSFORMER, POWER (AEP, G, IT, UK)	
		**	
		MISCELLANEOUS *************	
15	1-773-038-11	WIRE (FLAT TYPE) (17 CORE)	
24	1-769-910-11	WIRE (FLAT TYPE) (9 CORE)	
25	1-765-332-11	WIRE (FLAT TYPE) (15 CORE)	
26	1-776-933-11	WIRE (FLAT TYPE) (23 CORE)	
57	1-769-940-11	WIRE (FLAT TYPE) (11 CORE)	
60	1-769-848-11	WIRE (FLAT TYPE) (5 CORE)	
⚠64	1-569-007-11	ADAPTER, CONVERSION 2P (E)	
⚠64	1-569-008-11	ADAPTER, CONVERSION 2P (EA, MY, SP)	
⚠64	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (HK)	
⚠CNP901	1-575-651-11	CORD, POWER (AEP, G, IT, EA, MY, SP, HK)	
⚠CNP901	1-575-653-11	CORD, POWER (E)	
⚠CNP901	1-751-326-31	CORD, POWER (TH)	
⚠CNP901	1-751-520-21	CORD, POWER (UK)	
⚠F901	1-532-259-00	FUSE TIME LAG (1.6A, 250V)	(AEP, UK, G, IT, E, EA, MY, SP, HK)
⚠F902	1-532-237-00	FUSE TIME LAG (3.15A, 250V)	(E, EA, MY, SP, HK)
⚠F911	1-532-203-00	FUSE TIME LAG (2A, 250V)	
⚠F912	1-532-203-00	FUSE TIME LAG (2A, 250V)	
FL501	1-517-367-11	INDICATOR TUBE, FLUORESCENT	
IC913	8-759-231-57	IC TA7810S	
M801	1-698-748-11	MOTOR, FAN (DC)	
⚠T901	1-429-313-11	TRANSFORMER, POWER (E, EA, MY, SP, HK, TH)	
⚠T901	1-429-314-11	TRANSFORMER, POWER (AEP, UK, G, IT)	
		**	
		ACCESSORIES & PACKING MATERIALS ********************************	
*	4-980-537-01	CUSHION (UPPER)	
*	4-980-538-01	CUSHION (LOWER)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark

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****

****

HARDWARE LIST

****

Ref. No.	Part No.	Description	Remark
#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#2	7-682-548-04	SCREW +BVTT 3X8 (S)	
#3	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#4	7-685-650-79	SCREW +BVTP 3X16 TYPE2 IT-3	

TC-EX90/EX100

SERVICE MANUAL

AEP Model
UK Model
E Model

TC-EX90 is the deck section in MHC-EX50/EX90, and TC-EX100 is the deck section in MHC-EX70AV/EX100AV.

Photo : TC-EX100 (SILVER)

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Model Name Using Similar Mechanism		TC-EX5
Tape Transport Mechanism Type	DECK–A	TCM-190RA12CL
	DECK–B	TCM-190RB52C

SPECIFICATIONS

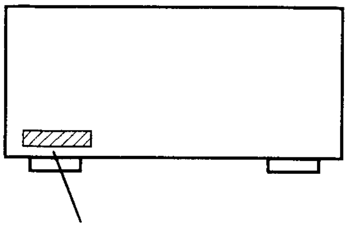
Recording system
4-track 2-channel stereo
Frequency response
(DOLBY NR OFF)
40 – 13,000 Hz (±3 dB),
using Sony TYPE I cassette
40 – 14,000 Hz (±3 dB),
using Sony TYPE II cassette
40 – 15,000 Hz (±3 dB),
using Sony TYPE IV cassette
Wow and flutter
0.1% WRMS ±0.3% (DIN)
Dimensions
Approx. 280 x 122.5 x 280 mm
(11 1/8 x 4 7/8 x 11 1/8 in) (w/h/d)
incl. projecting parts and controls
Mass Approx. 2.8 kg
(6 lb 2 oz)

MICROFILM

STEREO CASSETTE DECK

SONY®

MODEL IDENTIFICATION
— BACK PANEL —



TC-EX100 (AEP, UK Model)	: 4-978-260-0□
TC-EX100 (E Model)	: 4-978-260-1□
TC-EX100 (Saudi Arabia Model)	: 4-978-260-2□
TC-EX100 (Thailand Model)	: 4-978-260-3□
TC-EX90 (AEP, UK Model)	: 4-978-260-4□
TC-EX90 (E Model)	: 4-978-260-5□
TC-EX90 (Saudi Arabia Model)	: 4-978-260-6□
TC-EX90 (Thailand Model)	: 4-978-260-7□

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Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SAFETY-RELATED COMPONENT WARNING !!

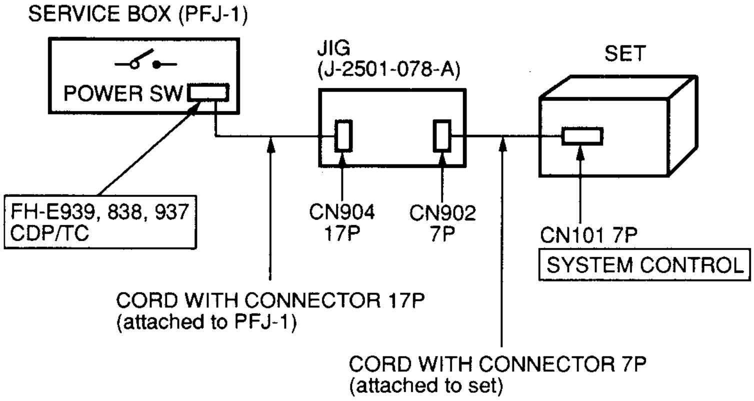
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1

SERVICING NOTE

How to operate with a single unit.

Normally, this set is not operated with its own.
The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.
Turn the power set of the service box ON. Then press the ■ button of both DECK A and DECK B at the same time to turn the power on.



SERVICE BOX (PFJ-1)
POWER SW
JIG
(J-2501-078-A)
SET
FH-E939, 838, 937
CDP/TC
CN904
17P
CN902
7P
CN101 7P
SYSTEM CONTROL
CORD WITH CONNECTOR 17P
(attached to PFJ-1)
CORD WITH CONNECTOR 7P
(attached to set)

[Tune light on all LED]

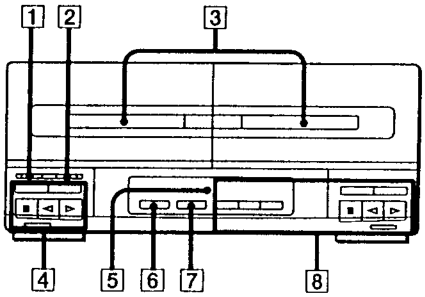
Push ■ button of DECK A and ○ REC MUTE button at the same time. then, all segments of LED turn on the light.
To cancel the mode, push ■ button of DECK A and ○ REC MUTE button at the same time again.

SECTION 2
GENERAL

This section is extracted from instruction manual.

Index to Parts and Controls

Front Panel

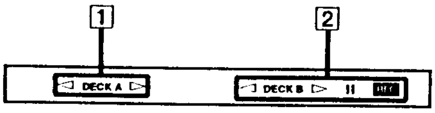


[1] DOLBY NR selector (15)
[2] DIRECTION MODE selector (14)
[3] Cassette compartments (14)
[4] Tape operating buttons (for deck A)
- ▷ (front side play) (14)
- ◁ (reverse side play) (14)
- ■ (stop) (14)
- ▶▶ (fast rightward and AMS**) (14)
- ◀◀ (fast leftward and AMS**) (14)
- ⏏ (eject) (14)

[5] Display window
[6] CD SYNC button (15)
[7] DUBBING MODE button (19)
[8] Tape operating buttons (for deck B)
- ▷ (front side play) (14)
- ◁ (reverse side play) (14)
- ■ (stop) (14)
- ▶▶ (fast rightward and AMS**) (14)
- ◀◀ (fast leftward and AMS**) (14)
- II PAUSE (14)
- ○ REC MUTE (16)
- ● REC (recording) (16)
- ⏏ (eject) (14)

**AMS: Automatic Music Sensor (14)

Display Window

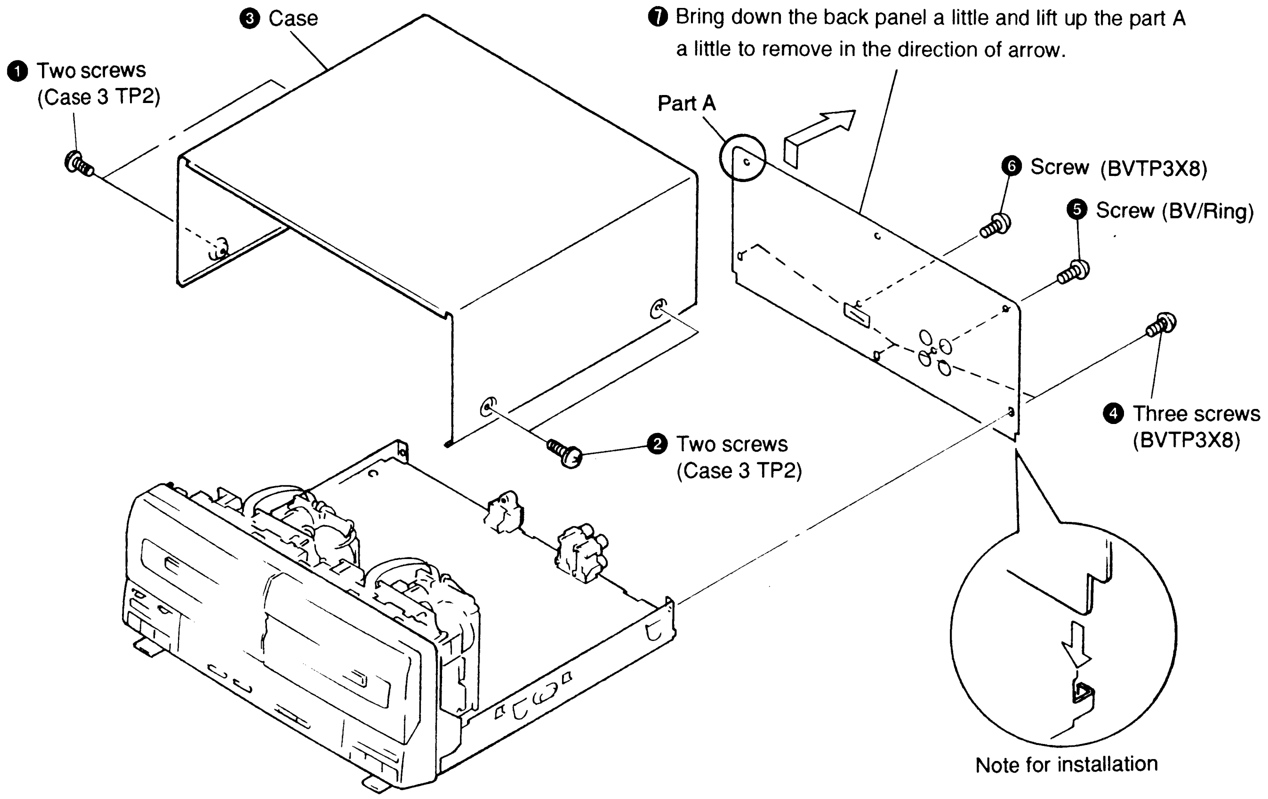


[1] Deck A status indication
[2] Deck B status indication

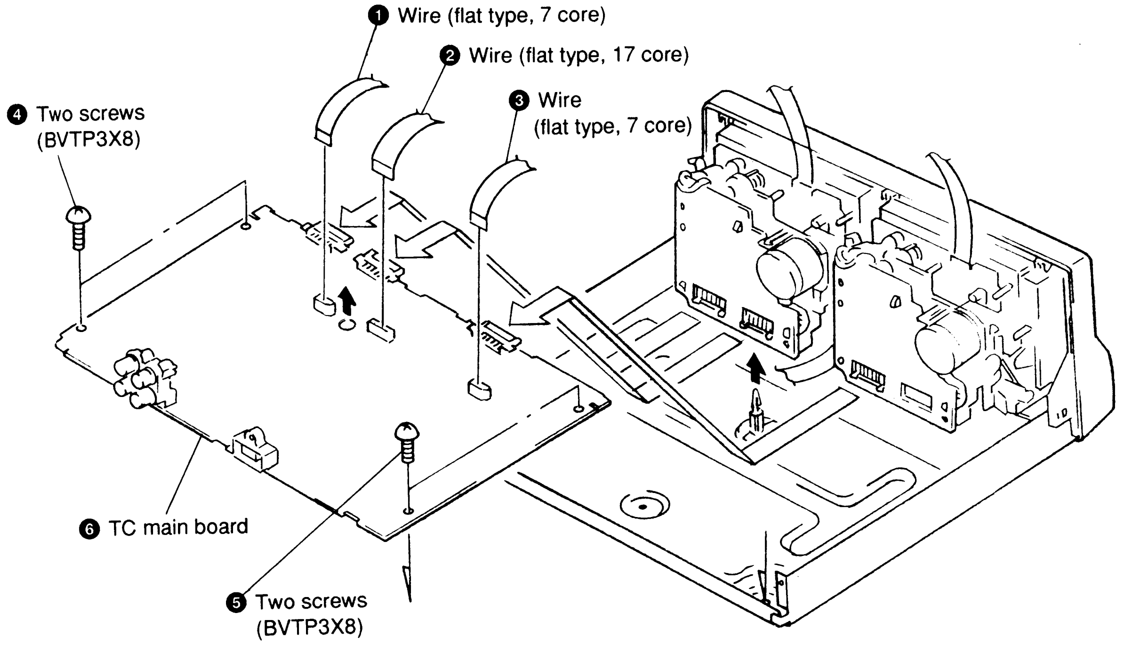
SECTION 3
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

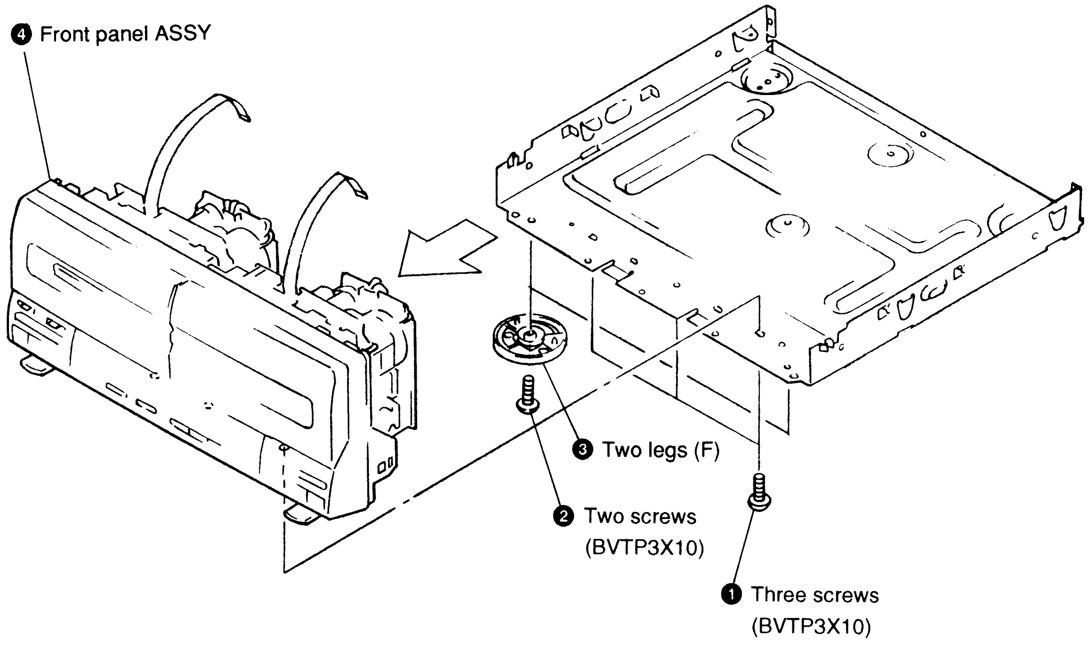
3-1. CASE AND BACK PANEL


③ Case
① Two screws (Case 3 TP2)
⑦ Bring down the back panel a little and lift up the part A a little to remove in the direction of arrow.
Part A
⑥ Screw (BVTP3X8)
⑤ Screw (BV/Ring)
④ Three screws (BVTP3X8)
② Two screws (Case 3 TP2)
Note for installation

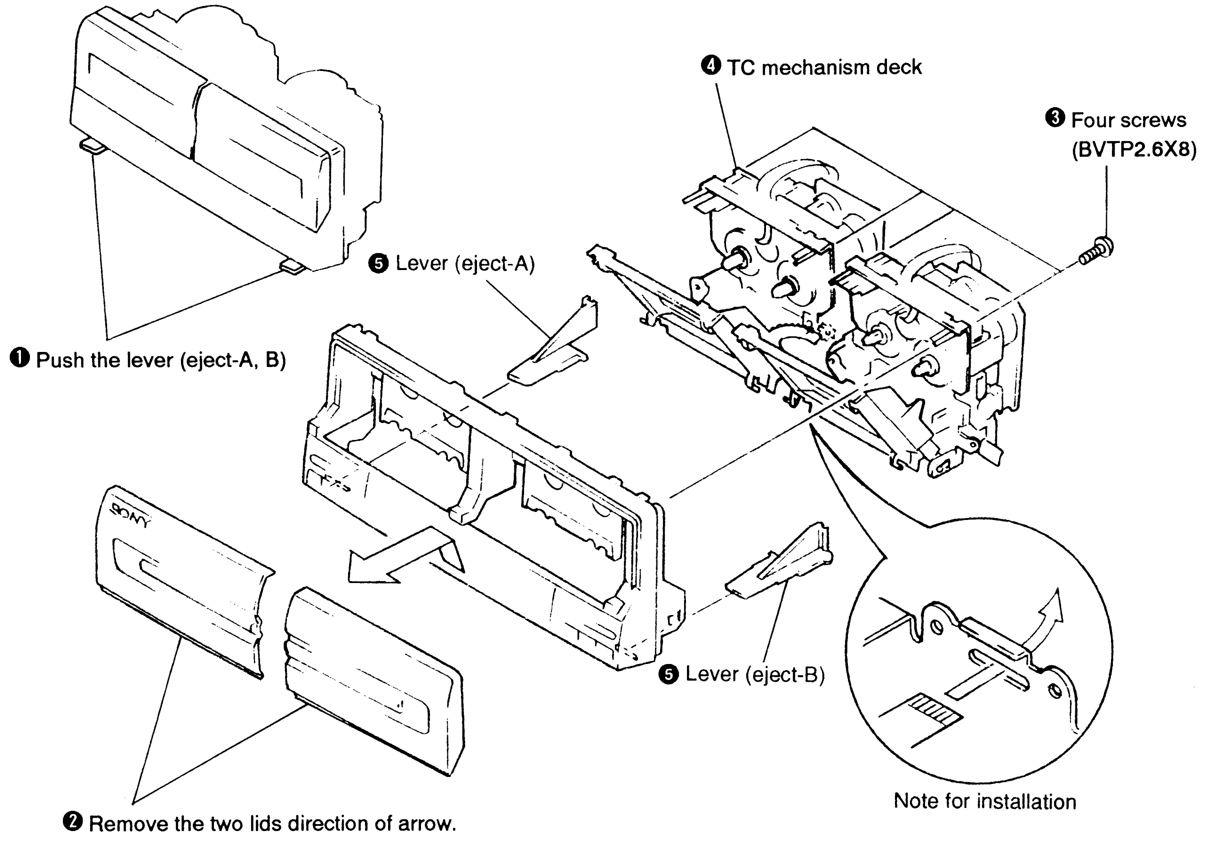
3-2. TC MAIN BOARD


① Wire (flat type, 7 core)
② Wire (flat type, 17 core)
③ Wire (flat type, 7 core)
④ Two screws (BVTP3X8)
⑥ TC main board
⑤ Two screws (BVTP3X8)

3-3. FRONT PANEL ASSY


④ Front panel ASSY
③ Two legs (F)
② Two screws (BVTP3X10)
① Three screws (BVTP3X10)

3-4. TC MECHANISM DECK


④ TC mechanism deck
③ Four screws (BVTP2.6X8)
⑤ Lever (eject-A)
① Push the lever (eject-A, B)
⑤ Lever (eject-B)
SONY
② Remove the two lids direction of arrow.
Note for installation

SECTION 4
ADJUSTMENTS

4-1. MECHANICAL ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured alcohol-moistened swab :

record/playback/erase head	pinch roller
rubber belts	capstan

2. Demagnetize the record/playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustment.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

Torque Measurement

Torque	Torque meter	Meter reading
Forward	CQ-102C	30 to 60 g • cm (0.42 to 0.83 oz • inch)
Forward Back tension	CQ-102C	1 to 5 g • cm (0.014 to 0.069 oz • inch)
Reverse	CQ-102RC	30 to 60 g • cm (0.42 to 0.83 oz • inch)
Reverse Back tension	CQ-102RC	1 to 5 g • cm (0.014 to 0.069 oz • inch)
FF, REW	CQ-201B	65 to 90 g • cm (0.91 to 1.25 oz • inch)

Tape Tension Measurement

Torque meter	Meter reading
CQ-403A	more than 110 g (more than 3.88 oz)

4-2. ELECTRICAL ADJUSTMENTS

PRECAUTION

1. The adjustment should be performed in the publication. (Be sure to male playback adjustment at first.)
2. The adjustments and measurement should be performed for both L-CH and R-CH.
   - Switche position
     DOLBY NR switch : OFF
     DIRECTION MODE switch : ⇆

Test Tape

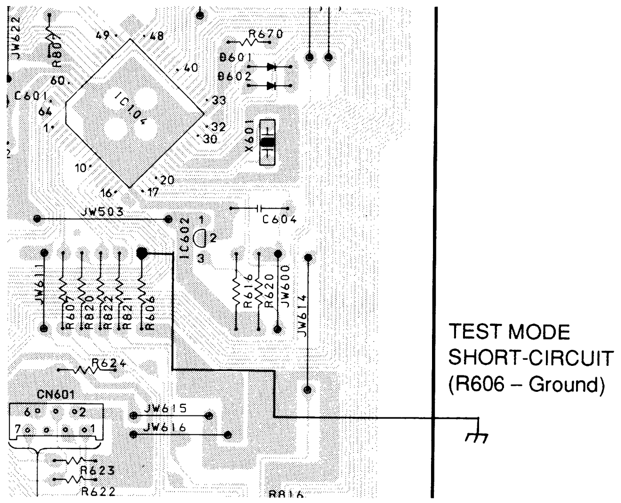
Tape	Contents	Use
P-4-A100	10 kH, −10 dB	Azimuth Adjustment
P-4-L300	315 Hz, 0 dB	PB Level Adjustment
WS-48B	3 kHz, 0 dB	Tape Speed Adjustment

0dB = 0.775V

Test mode

1. If the power supply is TA-EX50/EX70/EX90/EX100. (When AU BUS is alive)
   ① Short-circuit following portion (R606 – Ground) on the TC MAIN board.
   ② Turn the POWER on.
   ③ Open the short-circuit to release test mode.

[TC MAIN BOARD]



JW622
R807
R670
B601
B602
IC604
C601
X601
JW503
IC602
C604
R607
R820
R822
R821
R606
R616
R620
JW600
JW614
R624
CN601
JW615
JW616
R623
R622
TEST MODE
SHORT-CIRCUIT
(R606 – Ground)

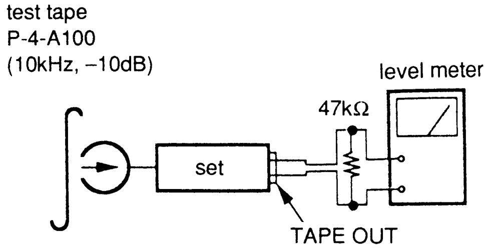
2. If the power supply is a jig.
   Turn the power set of the service box ON. Then press the ■ button of both DECK A and DECK B at the same time to turn the power on.

Record/Playback Head Azimuth Adjustment
DECK-A **DECK-B**

Note : Perform this adjustment for both decks.

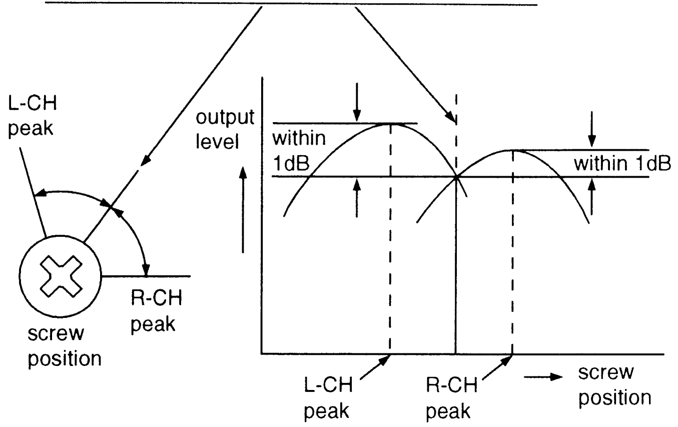
Procedure :

1. Mode : Forward playback

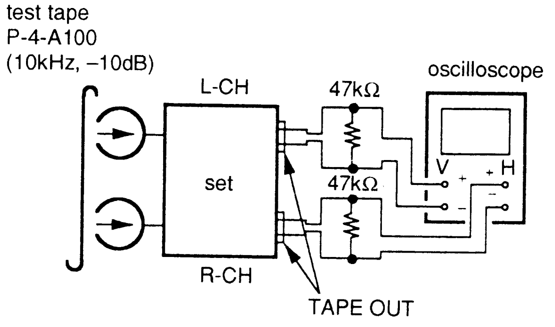


test tape
P-4-A100
(10kHz, −10dB)
level meter
47kΩ
set
TAPE OUT

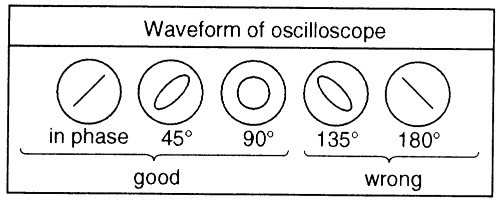
2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 1 dB.



3. Mode : Playback



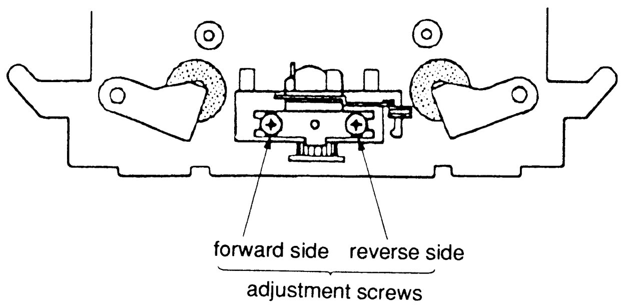
test tape
P-4-A100
(10kHz, −10dB)
L-CH
47kΩ
oscilloscope
set
47kΩ
V
H
R-CH
TAPE OUT



Waveform of oscilloscope
in phase
45°
90°
135°
180°
good
wrong

4. Change the reveres playback mode and repeat the steps 1 to 3.
5. After the adjustment, lock the adjustment screws with suitable locking compound.

Adjustment Location : — Record/Playback head —

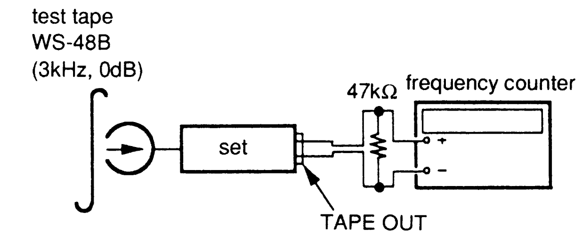


forward side
reverse side
adjustment screws

Note : To adjust Azimuth, after take off WINDOW ASSY, ILLUMINATOR and LID ASSY CASSETTE of FRONT PANEL.

Tape Speed Adjustment **DECK-A** **DECK-B**

Procedure :
Mode : Forward Playback



test tape
WS-48B
(3kHz, 0dB)
47kΩ
frequency counter
set
+
−
TAPE OUT

(high speed adjustment)

1. Set to FWD playback mode.
2. Press the DUBBING MODE button at HIGH position.
3. Adjust RV72 so that the frequency counter reading becomes 6,000 ± 60 Hz.

(normal speed adjustment)

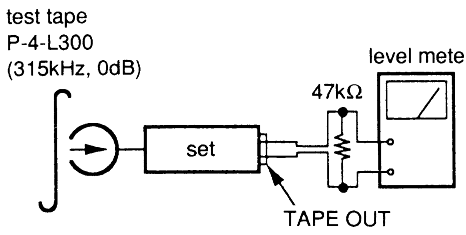
1. Set to FWD playback mode.
2. Set the DUBBING MODE button to NORMAL.
3. Adjust RV71 so that the frequency counter reading becomes 3,000 ± 30 Hz.

Frequency difference between the deck A and deck B the beginning of the tape should be within ± 1%.

Adjustment Location : AUDIO board. (See page 9)

Playback Level Adjustment **DECK-A** **DECK-B**

Procedure :
Mode : Forward Playback



test tape
P-4-L300
(315kHz, 0dB)
level meter
47kΩ
set
TAPE OUT

Adjust RV11 (L-CH) and RV21 (R-CH), so the level meter reading becomes the adjustment Level below.

Adjustment Level :
TAPE OUT level : -7.4 ± 1 dB (0.294 to 0.37 V)

Level difference between channels : within 0.5 dB.

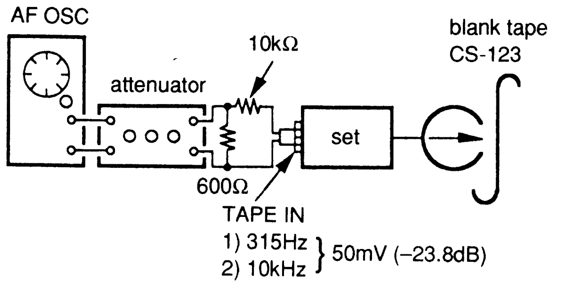
Confirm the TAPE OUT level does not change in playback mode while changing the mode from plaback to stop several times.

AdjustmentLocation : AUDIO board. (See page 9)

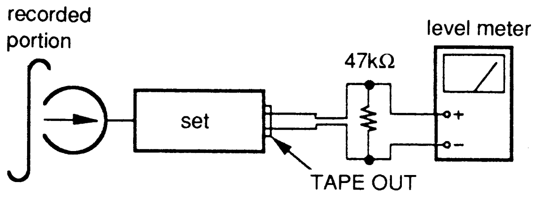
Record Bias Adjustment DECK-B

Procedure :

1. Mode : Record


AF OSC
attenuator
10kΩ
600Ω
set
blank tape
CS-123
TAPE IN
1) 315Hz
2) 10kHz
50mV (–23.8dB)

2. Mode : Playback

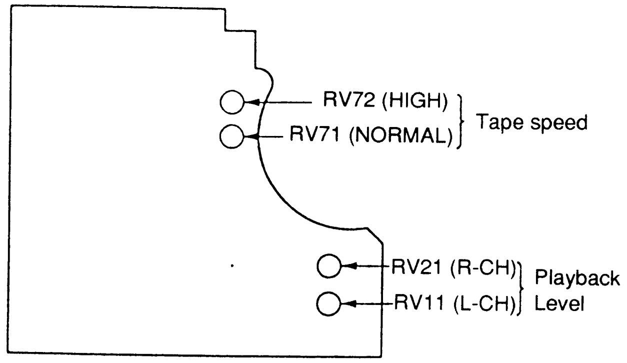

recorded
portion
set
47kΩ
level meter
TAPE OUT

Confirm that the 10 kHz playback output is 0 ± 0.5 dB relative to the 315 Hz output. If necessary, adjust RV12 (L-CH), RV22 (R-CH) and repeat the steps given adove.

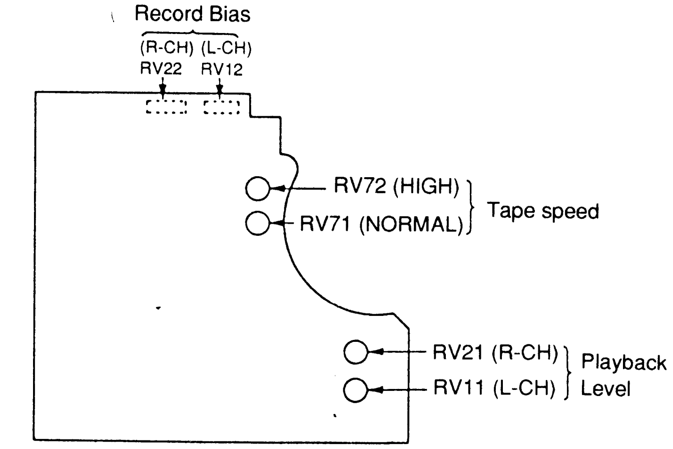
Adjustment Location : AUDIO board. (See page 9)

— Adjustment Parts Location Diagrams —

DECK A :
[MAIN BOARD] — Conductor side —


RV72 (HIGH)
RV71 (NORMAL)
Tape speed
RV21 (R-CH)
RV11 (L-CH)
Playback
Level

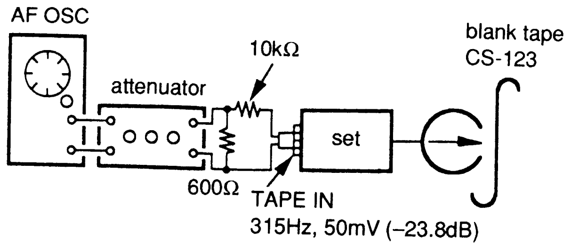
DECK B :
[AUDIO BOARD] — Conductor side —


Record Bias
(R-CH) (L-CH)
RV22 RV12
RV72 (HIGH)
RV71 (NORMAL)
Tape speed
RV21 (R-CH)
RV11 (L-CH)
Playback
Level

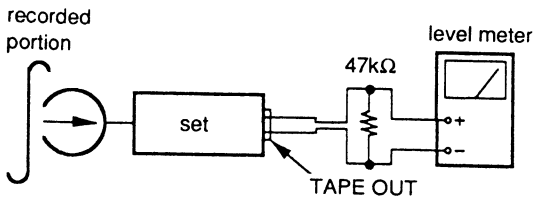
Record Level Adjustment DECK-B

Procedure :

1. Mode : Record


AF OSC
attenuator
10kΩ
600Ω
set
blank tape
CS-123
TAPE IN
315Hz, 50mV (–23.8dB)

2. Mode : Playback

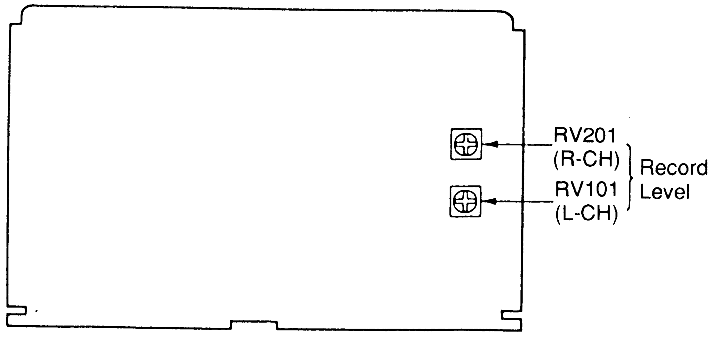

recorded
portion
set
47kΩ
level meter
TAPE OUT

Confirm playback the tape recorded become adjustment level as follows.
If necessary, adjust RV101 (L-CH), RV201 (R-CH) and repeat the steps 1 and 2.

Adjustment level :
TAPE OUT level : –23.8 ± 0.5 dB (47.2 to 53 mV)

Adjustment Location : TC MAIN board. (See page 9)

[TC MAIN BOARD] — Component side —


RV201
(R-CH)
RV101
(L-CH)
Record
Level

SECTION 5
DIAGRAMS

5-1. IC PIN FUNCTION

- **IC104 M38123M4-118FP SYSTEM CONTROL (TC MAIN BOARD)**

Pin No.	Pin Name	I/O	Function
1	B HALF	I	B Half detection input. "L": Presence "H": Nothing
2	KEY 3	I	Key input. (A/D converter analog input)
3	KEY 2	I	
4	KEY 1	I	
5	TEST	I	Electrical adjustment test mode setting. "L": Test mode
6	DISP RST	O	GND
7	DISP SYNC	O	
8	DISP CLK	O	
9	DISP OUT	O	
10	DISP IN	O	
11	B REEL 2	O	Deck B reel motor control output.
12	B REEL 3	O	
13	B REEL 1	O	
14	A REEL 1	O	Deck A reel motor control output.
15	A REEL 3	O	
16	A REEL 2	O	
17	PWR IN	I	+5V power supply input.
18	AUB IN	I	Audio bus input.
19	NRST	I	Microcomputer reset input.
20	AUB OUT	O	Audio bus output.
21	XC OUT	O	Not used. (GND)
22	X IN	I	Oscillator connection pins. (4 MHz)
23	X OUT	O	
24	Vss	–	GND
25	VER	–	
26	PWR OUT	O	Not used. (Open)
27	LINE MUTE	O	Line mute ON/OFF. "L": ON
28	BIAS	O	Bias oscillation control output. "L": ON
29	NC	–	GND
30	DAT FUNC	O	DAT mute output.
31	CD FUNC	O	CD mute output.
32	PASS	O	PASS amplifier switch output to dolby.
33	EQ H/L	O	REC equalizer switching output. "L": High speed "H": Normal speed
34	REC MUTE	O	REC mute output.
35	PB SEL	O	Play mode deck A/B select output. "L": DECK A "H": DECK B
36	AMS G SEL	O	AMS/BS mode select output. "H": AMS mode "L": BS mode
37	1599 MUTE	O	Mute output to IC101 (CXA1599Q). "H": ON "L": OFF
38	NC	–	Not used. (+5V)
39	NR RELAY	O	ALC (Automatic Level Control) control output.
40	CD SYNC	O	CD synchro dubbing LED output. "H": ON "L": OFF

	FF	TRIG	STOP	FWD
REEL 1	H	L	L	H
REEL 2	L	H	L	L
REEL 3	H	H	L	L

Pin No.	
41	DUB
42	DUB
43	PAU
44	REC
45	B◁
46	B▷
47	A◁
48	A▷
49	B ST
50	A ST
51	+7.5
52	REL
53	REC
54	CAP
55	B CA
56	A CA
57	VDD
58	VEE
59	AVs
60	VREF
61	A HA
62	BS.
63	AS.
64	AMS

ank tape
S-123

meter

ent level as

and repeat

53 mV)

e 9)

RV201 (R-CH)
RV101 (L-CH)
Record Level

SECTION 5
DIAGRAMS

5-1. IC PIN FUNCTION

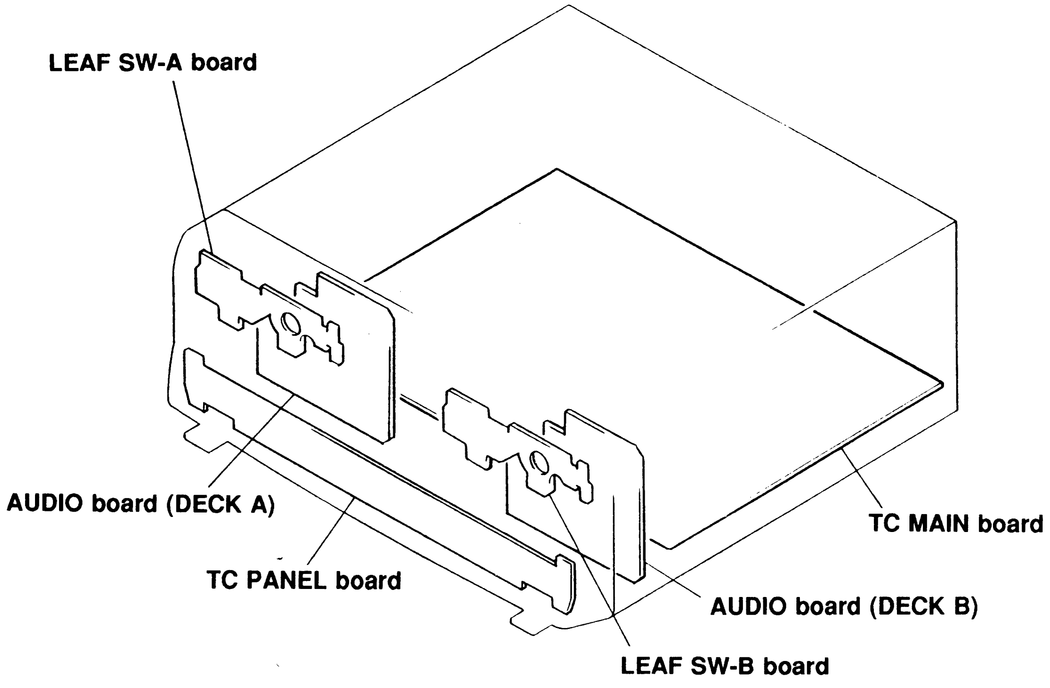
- **IC104 M38123M4-118FP SYSTEM CONTROL (TC MAIN BOARD)**

Pin No.	Pin Name	I/O	Function
1	B HALF	I	B Half detection input. "L": Presence "H": Nothing
2	KEY 3	I	Key input. (A/D converter analog input)
3	KEY 2	I	
4	KEY 1	I	
5	TEST	I	Electrical adjustment test mode setting. "L": Test mode
6	DISP RST	O	GND
7	DISP SYNC	O	
8	DISP CLK	O	
9	DISP OUT	O	
10	DISP IN	O	
11	B REEL 2	O	Deck B reel motor control output.
12	B REEL 3	O	
13	B REEL 1	O	
14	A REEL 1	O	Deck A reel motor control output.
15	A REEL 3	O	
16	A REEL 2	O	
17	PWR IN	I	+5V power supply input.
18	AUB IN	I	Audio bus input.
19	NRST	I	Microcomputer reset input.
20	AUB OUT	O	Audio bus output.
21	XC OUT	O	Not used. (GND)
22	X IN	I	Oscillator connection pins. (4 MHz)
23	X OUT	O	
24	Vss	–	GND
25	VER	–	
26	PWR OUT	O	Not used. (Open)
27	LINE MUTE	O	Line mute ON/OFF. "L": ON
28	BIAS	O	Bias oscillation control output. "L": ON
29	NC	–	GND
30	DAT FUNC	O	DAT mute output.
31	CD FUNC	O	CD mute output.
32	PASS	O	PASS amplifier switch output to dolby.
33	EQ H/L	O	REC equalizer switching output. "L": High speed "H": Normal speed
34	REC MUTE	O	REC mute output.
35	PB SEL	O	Play mode deck A/B select output. "L": DECK A "H": DECK B
36	AMS G SEL	O	AMS/BS mode select output. "H": AMS mode "L": BS mode
37	1599 MUTE	O	Mute output to IC101 (CXA1599Q). "H": ON "L": OFF
38	NC	–	Not used. (+5V)
39	NR RELAY	O	ALC (Automatic Level Control) control output.
40	CD SYNC	O	CD synchro dubbing LED output. "H": ON "L": OFF

	FF	TRIG	STOP	FWD
REEL 1	H	L	L	H
REEL 2	L	H	L	L
REEL 3	H	H	L	L

Pin No.	Pin Name	I/O	Function
41	DUB H	O	High speed dubbing LED output. "H": ON "L": OFF
42	DUB N	O	Normal speed dubbing LED output. "H": ON "L": OFF
43	PAUSE	O	PAUSE LED output. "H": ON "L": OFF
44	REC	O	REC LED output. "H": ON "L": OFF
45	B◁	O	Deck B REV LED output. "H": ON "L": OFF
46	B▷	O	Deck B FWD LED output. "H": ON "L": OFF
47	A◁	O	Deck A REV LED output. "H": ON "L": OFF
48	A▷	O	Deck A FWD LED output. "H": ON "L": OFF
49	B STOP SW	I	Deck B stop detect input. "H": STOP
50	A STOP SW	I	Deck A stop detect input. "H": STOP
51	+7.5V DET	I	+7.5V power supply detect input.
52	RELAY	O	Control output to REC/PB select output. "H": REC "L": PLAY
53	REC/PB	O	Dolby IC (IC103) REC/PB select output. "H": REC "L": PLAY
54	CAP. MOT H/L	O	Capstan motor HIGH/LOW select output. "H": HIGH "L": LOW
55	B CAP. MOTOR	O	Deck B capstan motor control output. "H": ON "L": OFF
56	A CAP. MOTOR	O	Deck A capstan motor control output. "H": ON "L": OFF
57	VDD	–	+5V power supply.
58	VEE	–	GND
59	AVss	–	
60	VREF	I	A/D converter reference power supply +5V.
61	A HALF	I	Deck A half detect input.
62	BS. REEL IN	I	Deck B reel table signal input.
63	AS. REEL IN	I	Deck A reel table signal input.
64	AMS IN	I	AMS input. "L": No song "H": Song

5-2. CIRCUIT BOARDS LOCATION

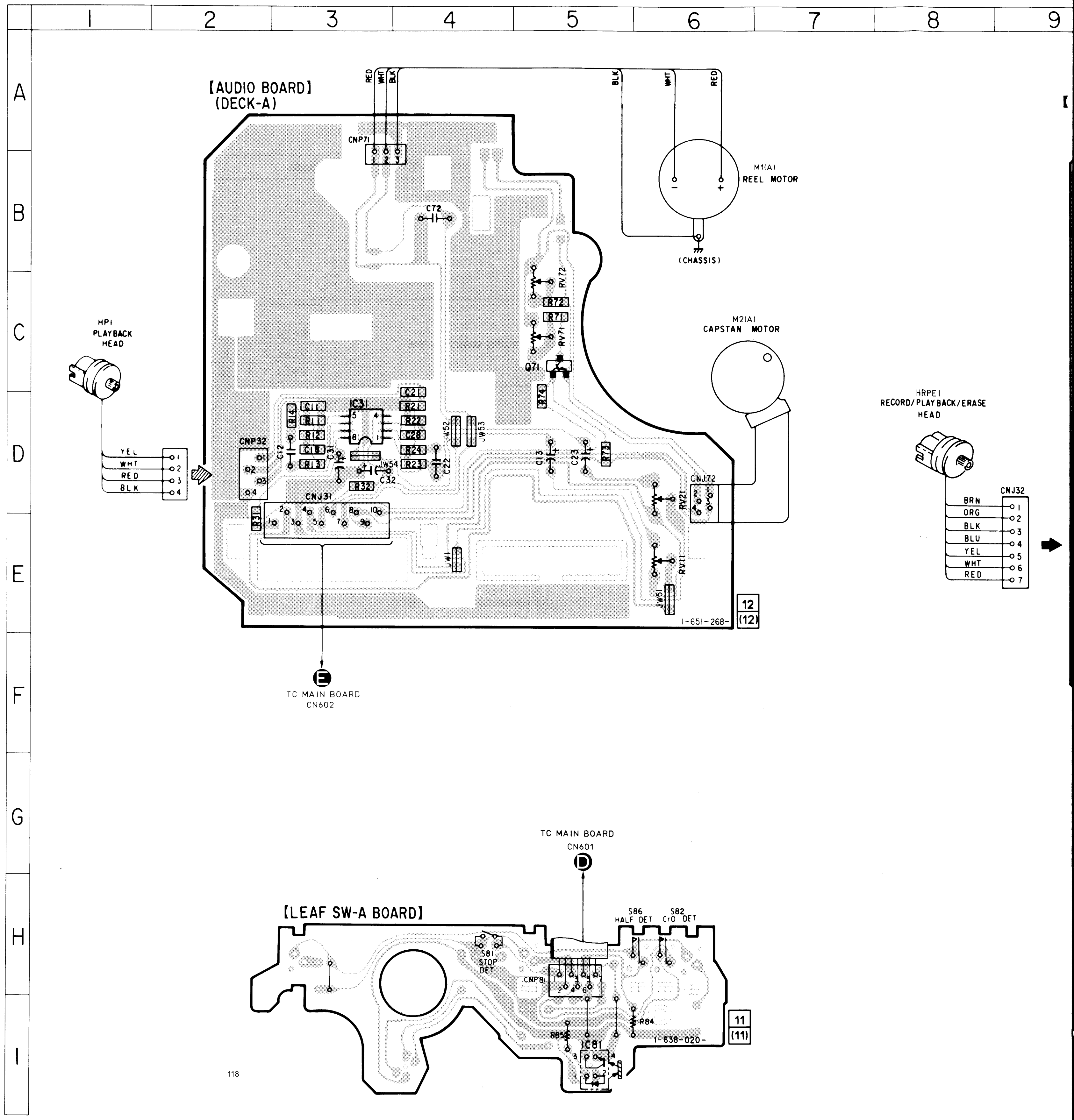

LEAF SW-A board
AUDIO board (DECK A)
TC PANEL board
TC MAIN board
AUDIO board (DECK B)
LEAF SW-B board

- **Semiconductor Location**

Ref. No.	Location
IC31 (DECK A)	D-3
IC31 (DECK B)	D-10
IC32	D-11
IC81 (DECK A)	I-5
IC81 (DECK B)	I-13
Q51	C-11
Q52	B-11
Q53	C-11
Q71 (DECK A)	C-5
Q71 (DECK B)	D-13

Note:
- o—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- ▒ : Pattern from the side which enable seeing.

5-3. PRINTED WIRING BOARD — AUDIO SECTION —


1
2
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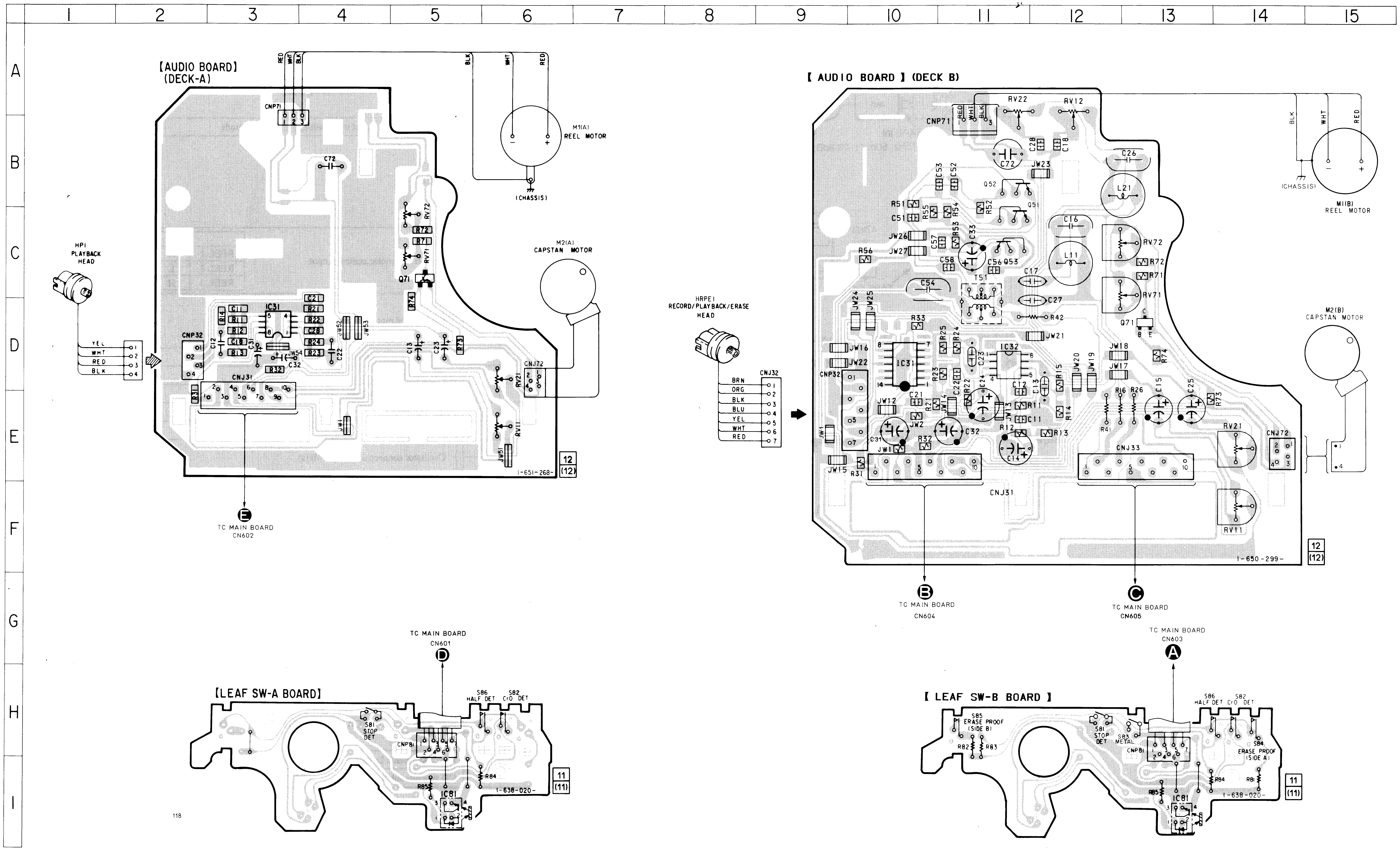
9
A
B
C
D
E
F
G
H
I
[AUDIO BOARD]
(DECK-A)
RED
WHT
BLK
CNP71
M1(A)
REEL MOTOR
(CHASSIS)
C72
RV72
R72
R71
RV71
Q71
M2(A)
CAPSTAN MOTOR
HP1
PLAYBACK
HEAD
YEL
WHT
RED
BLK
CNP32
C12
R14
C11
R11
R12
C18
R13
C31
IC31
C21
R21
R22
C28
R24
R23
JW54
C32
R32
C22
JW52
JW53
R74
C13
C23
R73
CNJ72
RV21
CNJ31
R31
JW1
RV11
JW51
1-651-268-
12
(12)
E
TC MAIN BOARD
CN602
HRPE1
RECORD/PLAYBACK/ERASE
HEAD
CNJ32
BRN
ORG
BLK
BLU
YEL
WHT
RED
TC MAIN BOARD
CN601
D
[LEAF SW-A BOARD]
S86
HALF DET
S82
CrO DET
S81
STOP
DET
CNP81
R84
R85
IC81
1-638-020-
11
(11)
118

onductor
on

o.	Location
CK A) CK B)	D-3 D-10
	D-11
CK A) CK B)	I-5 I-13
	C-11
	B-11
	C-11
CK A) CK B)	C-5 D-13

ponent side.
uctor side.
nable seeing.

5-3. PRINTED WIRING BOARD — AUDIO SECTION —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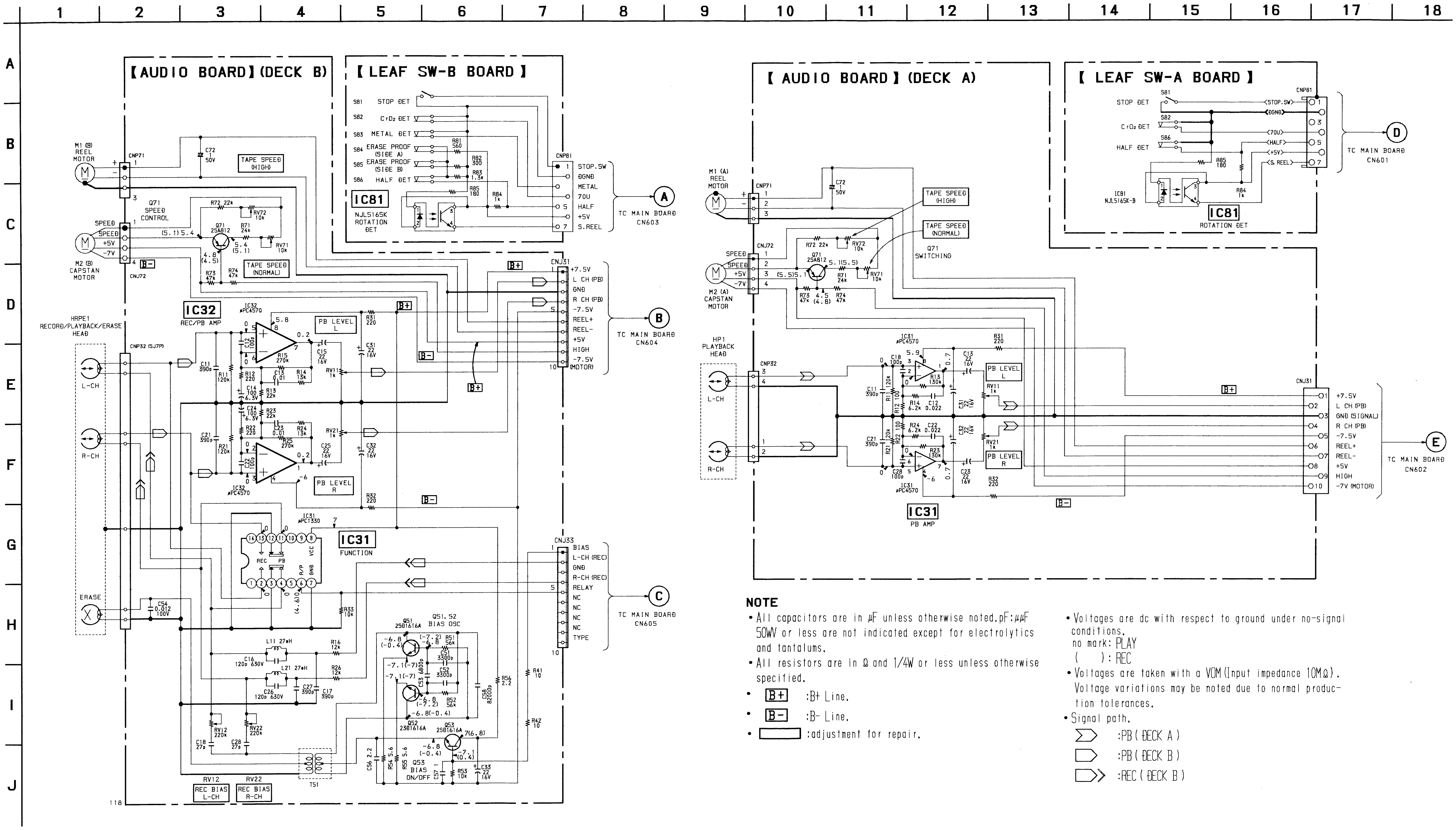
11
12
13
14
15
A
B
C
D
E
F
G
H
I
[AUDIO BOARD]
(DECK-A)
CNP71
M1(A)
REEL MOTOR
(CHASSIS)
M2(A)
CAPSTAN MOTOR
HP1
PLAYBACK
HEAD
YEL
WHT
RED
BLK
CNP32
CNJ31
CNJ72
IC31
Q71
1-651-268-
12
(12)
TC MAIN BOARD
CN602
[AUDIO BOARD] (DECK B)
CNP71
RV22
RV12
M1(B)
REEL MOTOR
M2(B)
CAPSTAN MOTOR
HRPE1
RECORD/PLAYBACK/ERASE
HEAD
BRN
ORG
BLK
BLU
YEL
WHT
RED
CNJ32
CNP32
IC31
IC32
T51
L21
L11
CNJ31
CNJ33
CNJ72
RV72
RV71
RV21
RV11
1-650-299-
12
(12)
TC MAIN BOARD
CN604
TC MAIN BOARD
CN605
TC MAIN BOARD
CN603
TC MAIN BOARD
CN601
[LEAF SW-A BOARD]
S86
HALF DET
S82
CrO DET
S81
STOP
DET
CNP81
R84
R85
IC81
1-638-020-
11
(11)
[LEAF SW-B BOARD]
S85
ERASE PROOF
(SIDE B)
R82
R83
S81
STOP
DET
S83
METAL
S84
ERASE PROOF
(SIDE A)
R81
1-638-020-
11
(11)
118

5-4. SCHEMATIC DIAGRAM — AUDIO SECTION —


1
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10
11
12
13
14
15
16
17
18
A
B
C
D
E
F
G
H
I
J
【AUDIO BOARD】(DECK B)
【LEAF SW-B BOARD】
【AUDIO BOARD】(DECK A)
【LEAF SW-A BOARD】
M1 (B) REEL MOTOR
M2 (B) CAPSTAN MOTOR
M1 (A) REEL MOTOR
M2 (A) CAPSTAN MOTOR
HRPE1 RECORD/PLAYBACK/ERASE HEAD
HP1 PLAYBACK HEAD
ERASE
L-CH
R-CH
CNP71
CNJ72
CNP32 (SJ7P)
CNP32
CNP81
CNJ31
CNJ33
Q71 SPEED CONTROL
Q71 SWITCHING
TAPE SPEED (HIGH)
TAPE SPEED (NORMAL)
IC81 NJL5165K ROTATION DET
IC81 ROTATION DET
IC32 REC/PB AMP
IC32 μPC4570
IC31 FUNCTION
IC31 μPC1330
IC31 PB AMP
IC31 μPC4570
PB LEVEL L
PB LEVEL R
Q51, 52 BIAS OSC
Q53 BIAS ON/OFF
T51
RV12 REC BIAS L-CH
RV22 REC BIAS R-CH
S81 STOP DET
S82 CrO2 DET
S83 METAL DET
S84 ERASE PROOF (SIDE A)
S85 ERASE PROOF (SIDE B)
S86 HALF DET
STOP.SW
DGND
METAL
70U
HALF
+5V
S.REEL
TC MAIN BOARD CN603
+7.5V
L CH (PB)
GND
R CH (PB)
-7.5V
REEL+
REEL-
HIGH
-7.5V (MOTOR)
TC MAIN BOARD CN604
BIAS
L-CH (REC)
R-CH (REC)
RELAY
NC
TYPE
TC MAIN BOARD CN605
TC MAIN BOARD CN601
GND (SIGNAL)
-7V (MOTOR)
TC MAIN BOARD CN602
A
B
C
D
E
B+
B-

NOTE

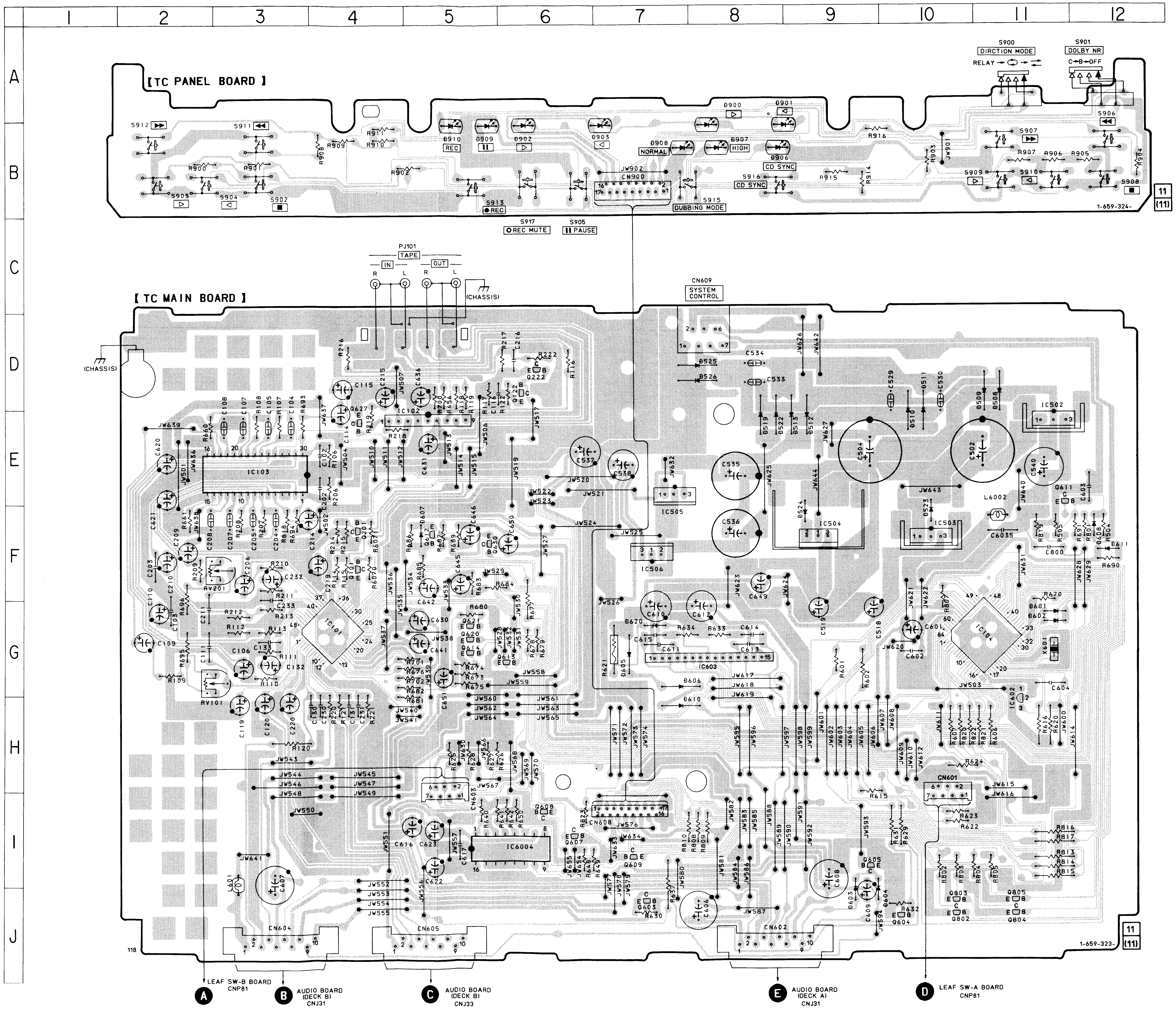
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- B+ :B+ Line.
- B- :B- Line.
- ☐ :adjustment for repair.
- Voltages are dc with respect to ground under no-signal conditions.
  no mark: PLAY
  ( ) : REC
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Signal path.
  〉 :PB (DECK A)
  ▷ :PB (DECK B)
  ▷〉 :REC (DECK B)

5-5. PRINTED WIRING BOARD — TC SECTION —

• See page 12 for Circuit Boards Location.

- **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D508	D-11	IC102	E-5
D509	D-11	IC103	E-3
D510	E-10	IC104	G-11
D511	E-10	IC502	E-11
D512	E-9	IC503	F-10
D513	E-9	IC504	F-9
D519	E-8	IC505	E-7
D522	E-8	IC506	F-7
D523	F-10	IC602	H-11
D524	F-9	IC603	G-8
D525	D-8	IC6004	I-6
D526	D-8		
D601	G-11	Q101	F-4
D602	G-11	Q122	D-6
D603	J-9	Q201	F-4
D604	J-9	Q222	D-6
D605	G-7	Q603	J-7
D606	G-7	Q604	J-10
D607	F-5	Q605	I-9
D608	F-12	Q607	I-6
D610	H-7	Q608	I-6
D611	F-12	Q609	I-7
D620	G-7	Q611	F-11
D900	B-8	Q612	F-5
D901	B-8	Q613	G-6
D902	B-6	Q614	G-5
D903	B-7	Q620	G-5
D906	B-8	Q621	G-5
D907	B-8	Q627	E-4
D908	B-7	Q630	F-5
D909	B-5	Q802	J-10
D910	B-5	Q803	J-10
		Q804	J-11
IC101	G-4	Q805	J-11


1
2
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4
5
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7
8
9
10
11
12
A
B
C
D
E
F
G
H
I
J
[TC PANEL BOARD]
S900
DIRCTION MODE
RELAY
S901
DOLBY NR
C B OFF
S912
S911
S903
S904
S902
S913
●REC
S917
○REC MUTE
S905
II PAUSE
S915
DUBBING MODE
S916
CD SYNC
S906
S907
S908
S909
S910
D900
D901
D902
D903
D906
D907
HIGH
D908
NORMAL
D909
D910
REC
JW902
CN900
1-659-324-
11
(11)
PJ101
TAPE
IN
OUT
R
L
(CHASSIS)
CN609
SYSTEM CONTROL
[TC MAIN BOARD]
IC101
IC102
IC103
IC104
IC502
IC503
IC504
IC505
IC506
IC603
IC6004
CN601
CN602
CN604
CN605
CN608
RV101
RV201
L6002
1-659-323-
11
(11)
118
A
LEAF SW-B BOARD
CNP81
B
AUDIO BOARD
(DECK B)
CNJ31
C
AUDIO BOARD
(DECK B)
CNJ33
E
AUDIO BOARD
(DECK A)
CNJ31
D
LEAF SW-A BOARD
CNP81

Note:

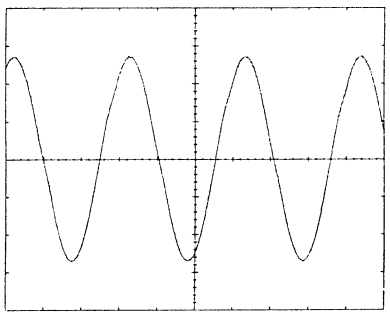
- o—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- △ : internal component.
- ▨ : Pattern from the side which enable seeing.

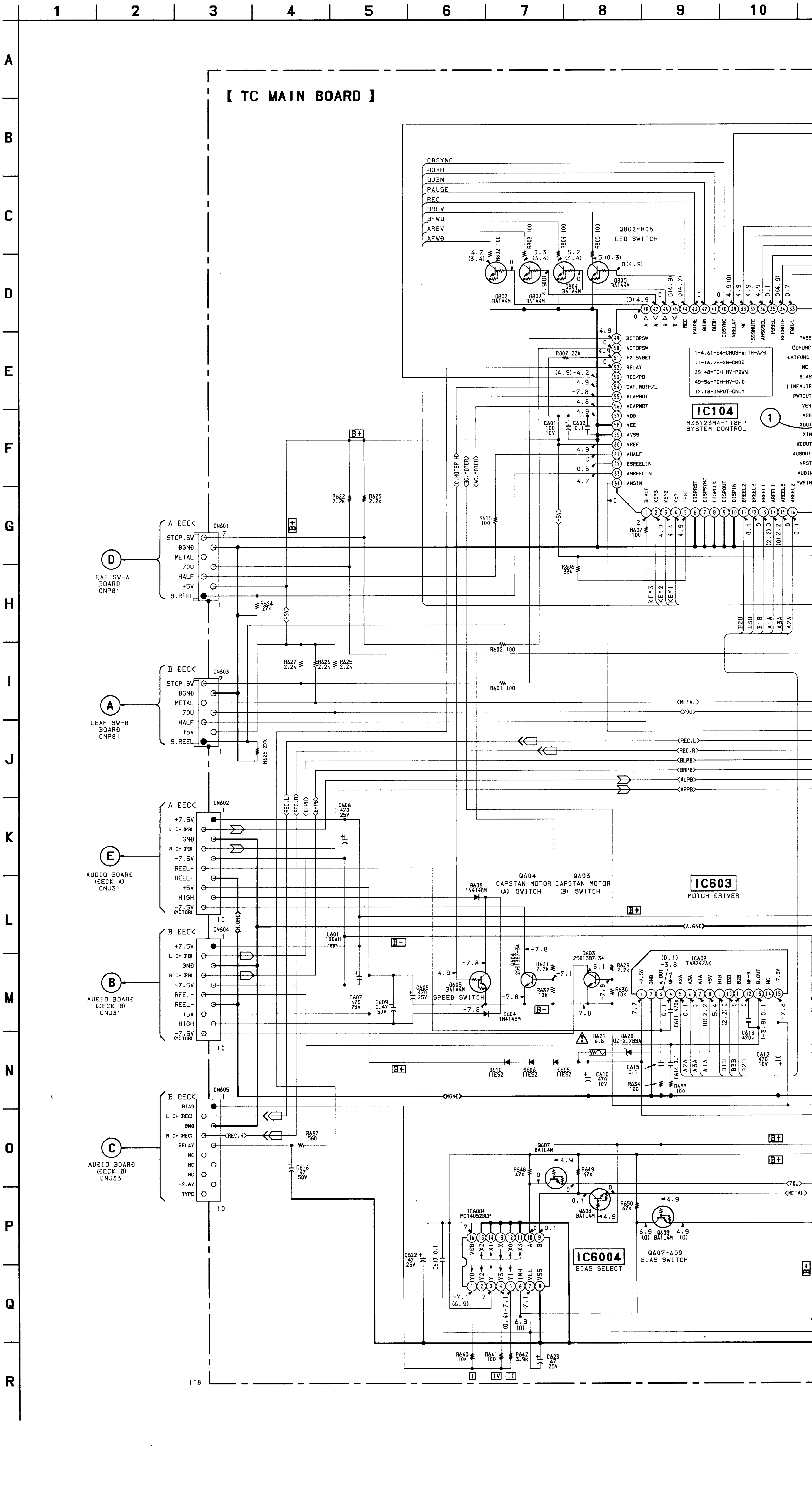
5-6. SCHEMATIC DIAGRAM — TC SECTION —

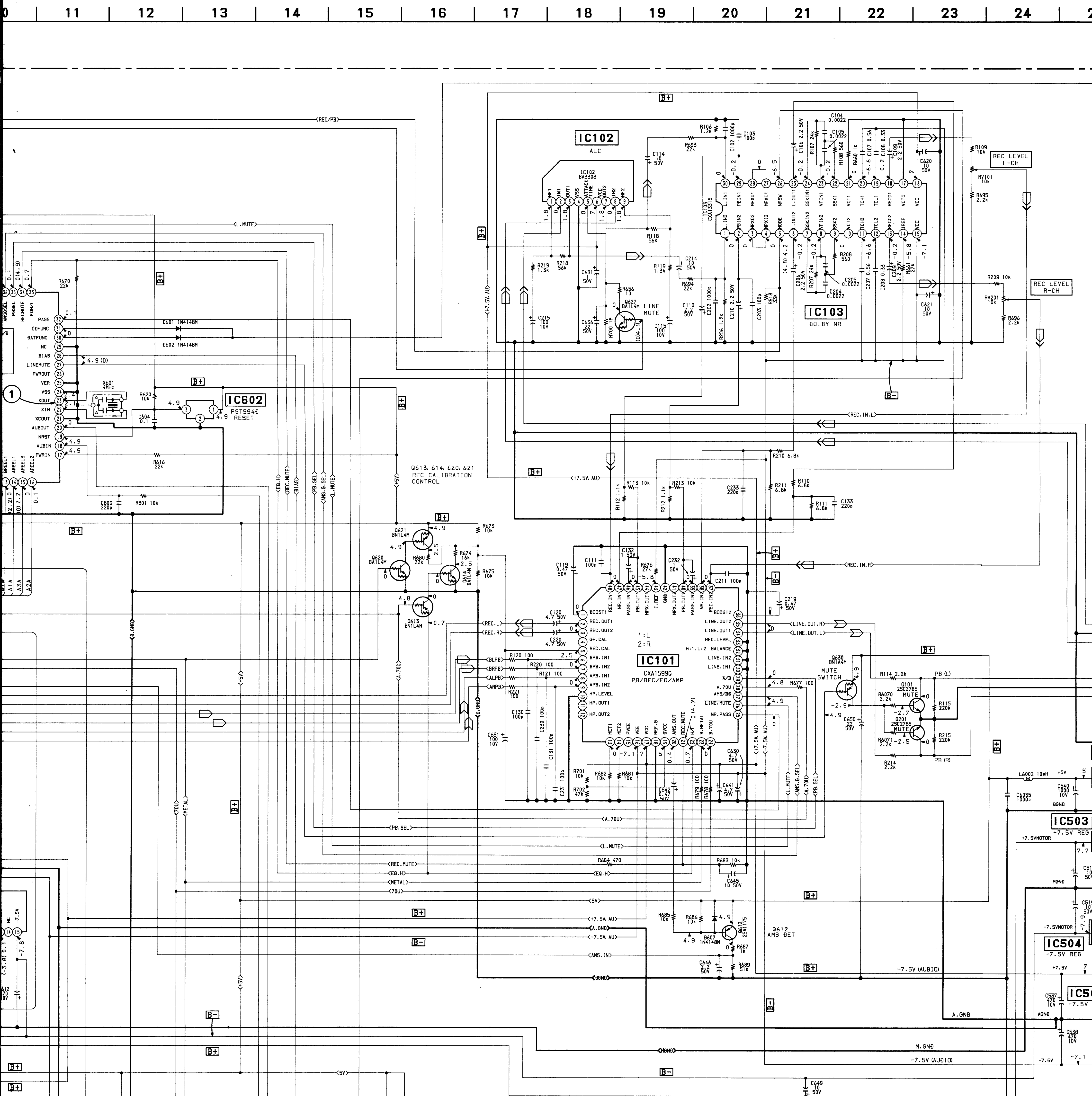
- See page 10 for IC Pin function. (IC104)
- See page 23 for IC Block Diagrams.

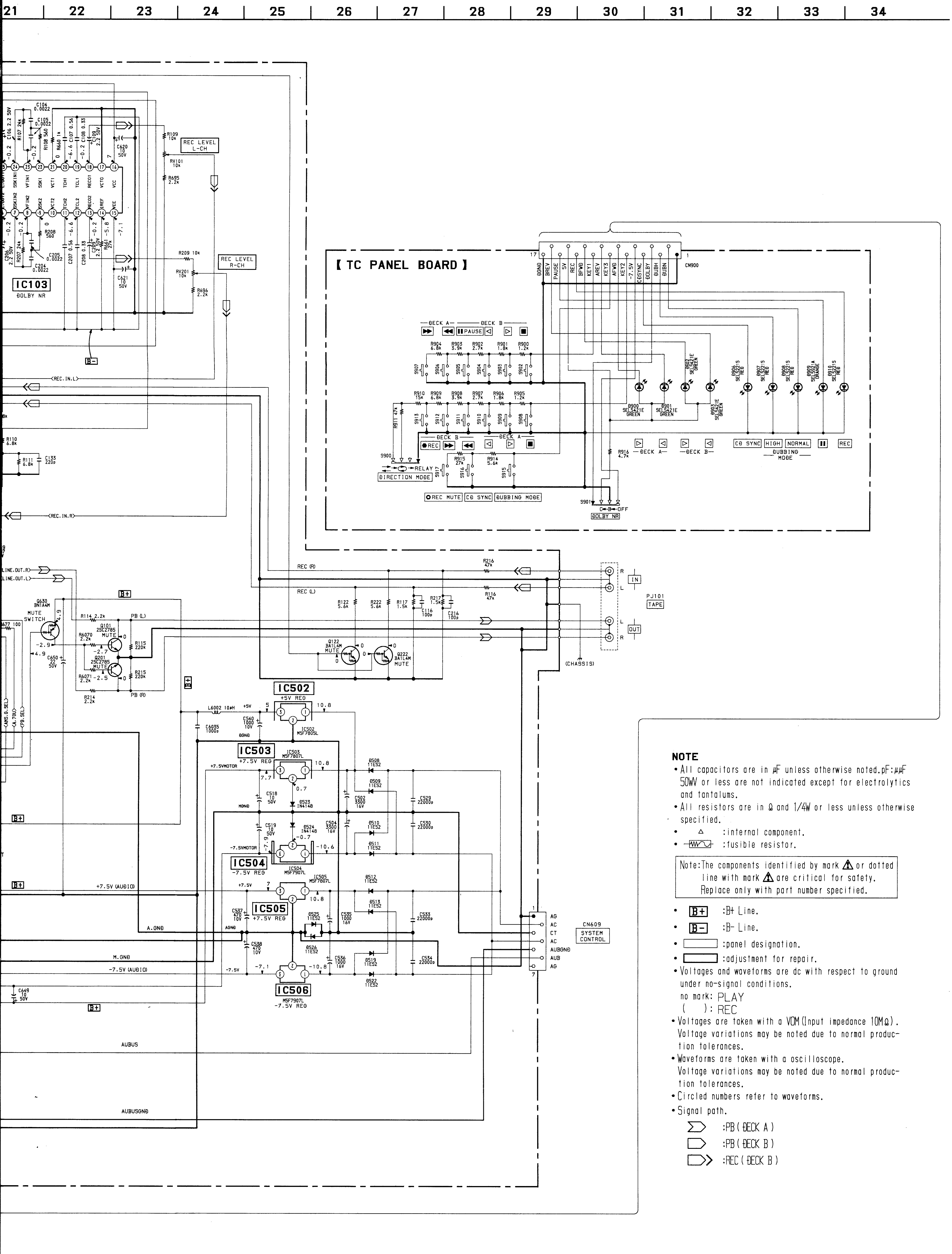
- **Waveform**

① IC104 ㉓ 4.5 Vp-p 4MHz






11
12
13
14
15
16
17
18
19
20
21
22
23
24
IC102
ALC
IC102 BA3308
IC103
DOLBY NR
IC103 CXA1331S
REC LEVEL L-CH
REC LEVEL R-CH
RV101 10k
RV201 10k
Q627 BA1L4M LINE MUTE
IC602
PST9940 RESET
X601 4MHz
Q613, 614, 620, 621 REC CALIBRATION CONTROL
Q621 BN1L4M
Q620 BA1L4M
Q613 BN1L4M
Q614 BA1L4M
IC101
CXA1599Q
PB/REC/EQ/AMP
1:L
2:R
Q630 BN1A4M MUTE SWITCH
Q101 2SC2785 MUTE
Q201 2SC2785 MUTE
PB (L)
PB (R)
IC503
+7.5V REG
IC504
-7.5V REG
Q612 2SA1175 AMS DET
Q611 2SC2785 AU BUS SWITCH
D611 1N4148
D608 1N4148M
D601 1N4148M
D602 1N4148M
D607 1N4148M
CN608
<REC/PB>
<L.MUTE>
<REC.IN.L>
<REC.IN.R>
<+7.5V.AU>
<REC.L>
<REC.R>
<BLPB>
<BRPB>
<ALPB>
<ARPB>
<LINE.OUT.R>
<LINE.OUT.L>
<A.70U>
<PB.SEL>
<REC.MUTE>
<EQ.H>
<METAL>
<70U>
<5V>
<A.GND>
<-7.5V.AU>
<AMS.IN>
<DGND>
<MGND>
<AUBUS.IN>
<AUBUS.OUT>
<AMS.0.SEL>
<BIAS>
+7.5V (AUDIO)
-7.5V (AUDIO)
M.GND
A.GND
AUBUS
AUBUSGND
L6002 10μH
+7.5VMOTOR
-7.5VMOTOR
PASS
CDFUNC
BATFUNC
NC
BIAS
LINEMUTE
PWROUT
VER
VSS
XOUT
XIN
XCOUT
AUBOUT
NRST
AUBIN
PWRIN
BREV
PAUSE
REC
BFWD
KEY1
AREV
KEY2
AFWD
KEY3
CDSYNC
DUBH
DUBN


21
22
23
24
25
26
27
28
29
30
31
32
33
34
IC103
DOLBY NR
REC LEVEL L-CH
REC LEVEL R-CH
RV101 10k
RV201 10k
【 TC PANEL BOARD 】
CN900
DGND
BREV
PAUSE
5V
REC
BFWD
KEY1
AREV
KEY3
AFWD
KEY2
-7.5V
CDSYNC
DOLBY
DUBH
DUBN
DECK A
DECK B
PAUSE
REC
RELAY
DIRECTION MODE
REC MUTE
CD SYNC
DUBBING MODE
DOLBY NR
C◄B◄OFF
HIGH
NORMAL
DUBBING MODE
REC (R)
REC (L)
PJ101
TAPE
IN
OUT
(CHASSIS)
Q122 BA1L4M MUTE
Q222 BA1L4M MUTE
Q630 BN1A4M MUTE SWITCH
Q101 2SC2785 MUTE
Q201 2SC2785 MUTE
PB (L)
PB (R)
LINE.OUT.R
LINE.OUT.L
REC.IN.L
REC.IN.R
B+
B-
IC502
+5V REG
IC503
+7.5V REG
IC504
-7.5V REG
IC505
+7.5V REG
IC506
-7.5V REG
+7.5VMOTOR
-7.5VMOTOR
+7.5V (AUDIO)
-7.5V (AUDIO)
A.GND
M.GND
AUBUS
AUBUSGND
CN609
SYSTEM CONTROL
AG
AC
CT
AC
AUBGND
AUB
AG

NOTE

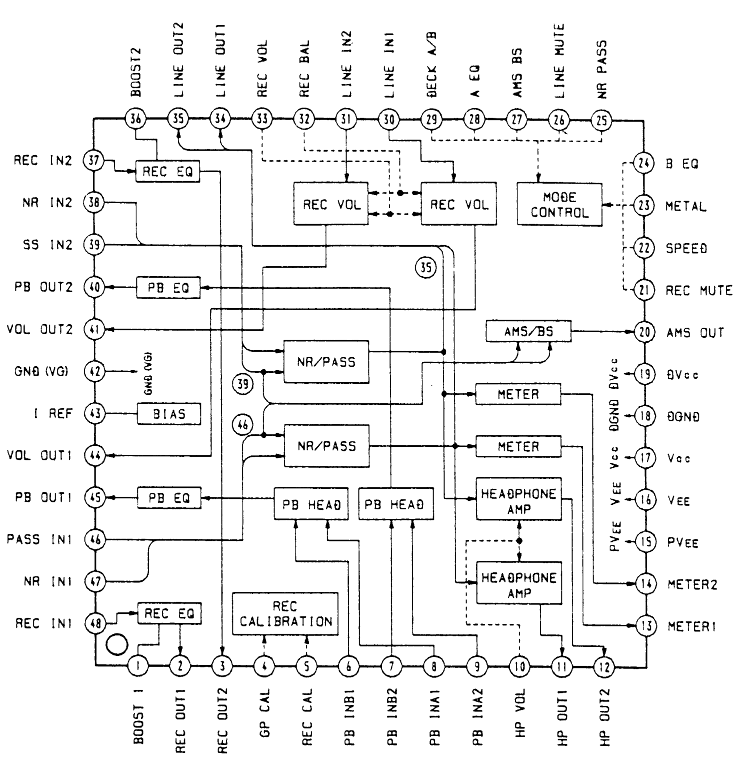
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ :internal component.
- —WW∿— :fusible resistor.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

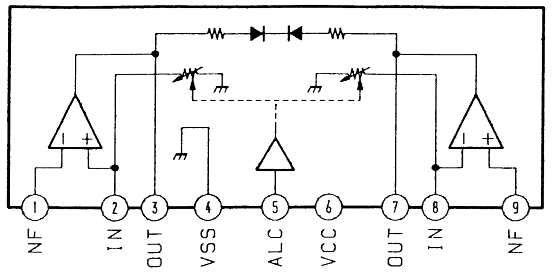
- B+ :B+ Line.
- B- :B- Line.
- ▭ :panel designation.
- ▭ :adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
  no mark: PLAY
  ( ): REC
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  - ⊳ :PB (DECK A)
  - ⊳ :PB (DECK B)
  - ⊳> :REC (DECK B)

5-7. IC BLOCK DIAGRAMS

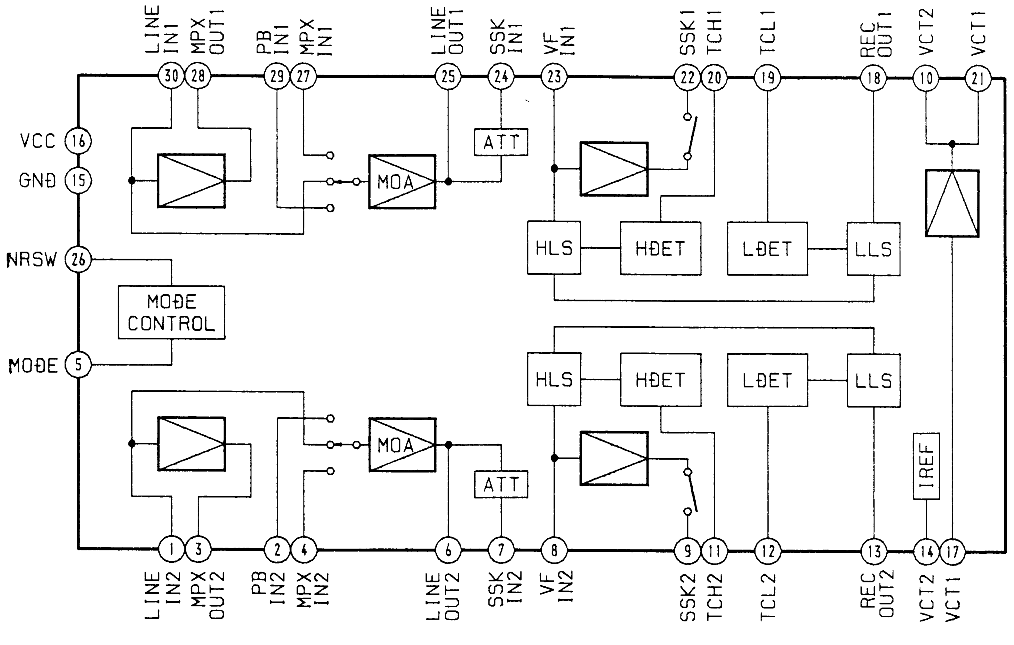
IC101 CXA1599Q


BOOST2
LINE OUT2
LINE OUT1
REC VOL
REC BAL
LINE IN2
LINE IN1
DECK A/B
A EQ
AMS BS
LINE MUTE
NR PASS
REC IN2
NR IN2
SS IN2
PB OUT2
VOL OUT2
GND (VG)
I REF
VOL OUT1
PB OUT1
PASS IN1
NR IN1
REC IN1
B EQ
METAL
SPEED
REC MUTE
AMS OUT
DVcc
DGND
Vcc
VEE
PVEE
METER2
METER1
BOOST 1
REC OUT1
REC OUT2
GP CAL
REC CAL
PB INB1
PB INB2
PB INA1
PB INA2
HP VOL
HP OUT1
HP OUT2
REC EQ
REC VOL
MODE CONTROL
PB EQ
AMS/BS
NR/PASS
METER
BIAS
PB HEAD
HEADPHONE AMP
REC CALIBRATION

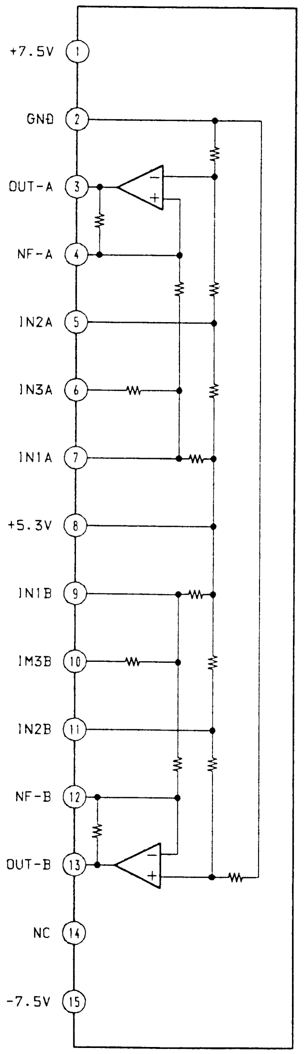
IC102 BA3308


NF
IN
OUT
VSS
ALC
VCC
OUT
IN
NF

IC103 CXA1331S


LINE IN1
MPX OUT1
PB IN1
MPX IN1
LINE OUT1
SSK IN1
VF IN1
SSK1 TCH1
TCL1
REC OUT1
VCT2
VCT1
VCC
GND
NRSW
MODE
ATT
MOA
HLS
HDET
LDET
LLS
MODE CONTROL
IREF
LINE IN2
MPX OUT2
PB IN2
MPX IN2
LINE OUT2
SSK IN2
VF IN2
SSK2 TCH2
TCL2
REC OUT2
VCT2
VCT1

IC603 TA8242AK


+7.5V
GND
OUT-A
NF-A
IN2A
IN3A
IN1A
+5.3V
IN1B
IM3B
IN2B
NF-B
OUT-B
NC
-7.5V

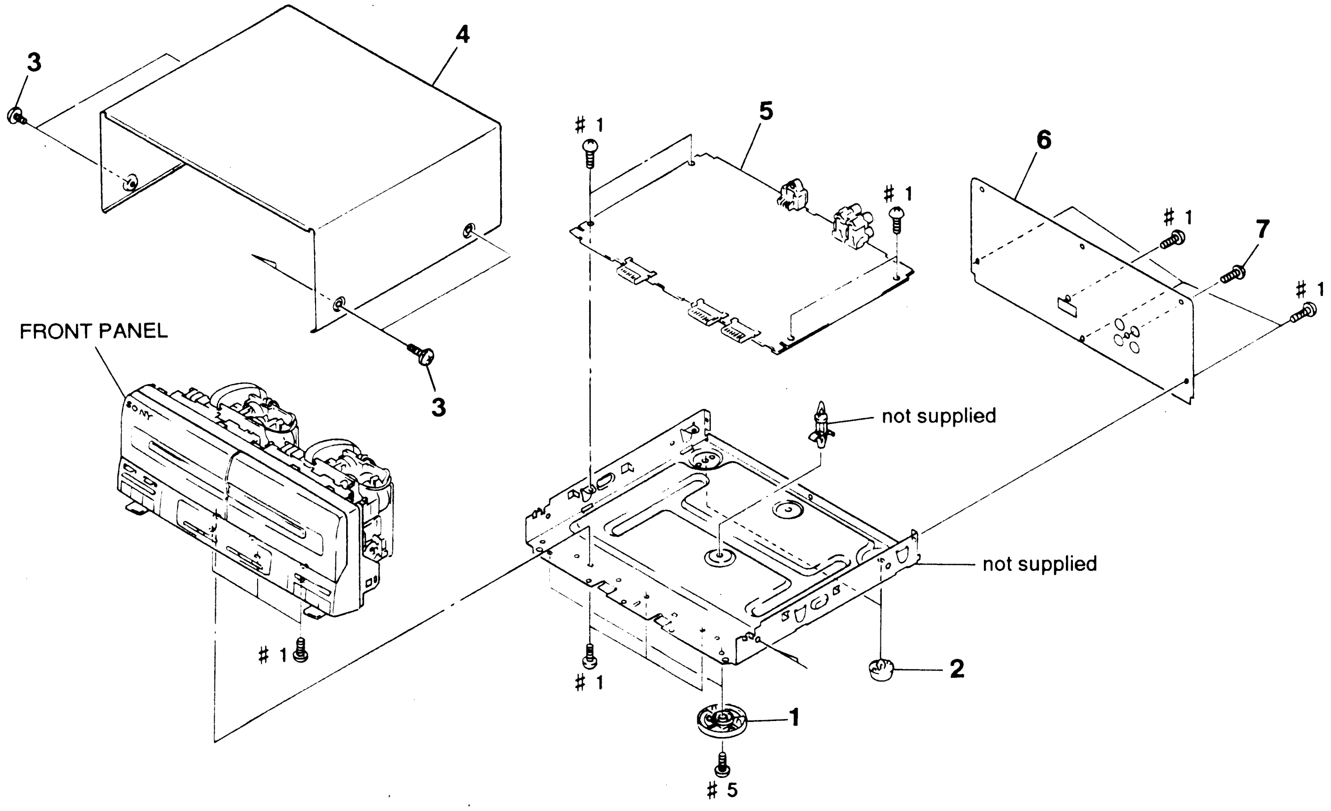
SECTION 6
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ Parts color ↑ Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  EA : Saudi Arabia model
  TH : Thailand model

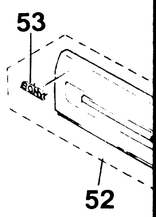
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

6-1. CHASSIS SECTION


3
4
5
6
7
# 1
FRONT PANEL
3
not supplied
not supplied
# 1
# 1
2
1
# 5

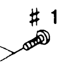
Ref. No.	Part No.	Description	Remark
1	4-977-699-11	LEG (F)	
2	4-965-822-01	FOOT	
3	3-363-099-01	SCREW (CASE 3 TP2)	
∗ 4	4-978-245-51	CASE (SILVER)	
∗ 4	4-978-245-71	CASE (BLACK)	
∗ 5	A-2007-477-A	TC MAIN BOARD, COMPLETE	
∗ 6	4-978-260-01	PANEL, BACK (EX100:AEP, UK)	
∗ 6	4-978-260-11	PANEL, BACK (EX100:E)	
∗ 6	4-978-260-21	PANEL, BACK (EX100:EA)	
∗ 6	4-978-260-31	PANEL, BACK (EX100:TH)	
∗ 6	4-978-260-41	PANEL, BACK (EX90:AEP, UK)	
∗ 6	4-978-260-51	PANEL, BACK (EX90:E)	
∗ 6	4-978-260-61	PANEL, BACK (EX90:EA)	
∗ 6	4-978-260-71	PANEL, BACK (EX90:TH)	
7	3-704-515-01	SCREW (BV/RING)	

6-2. FRO



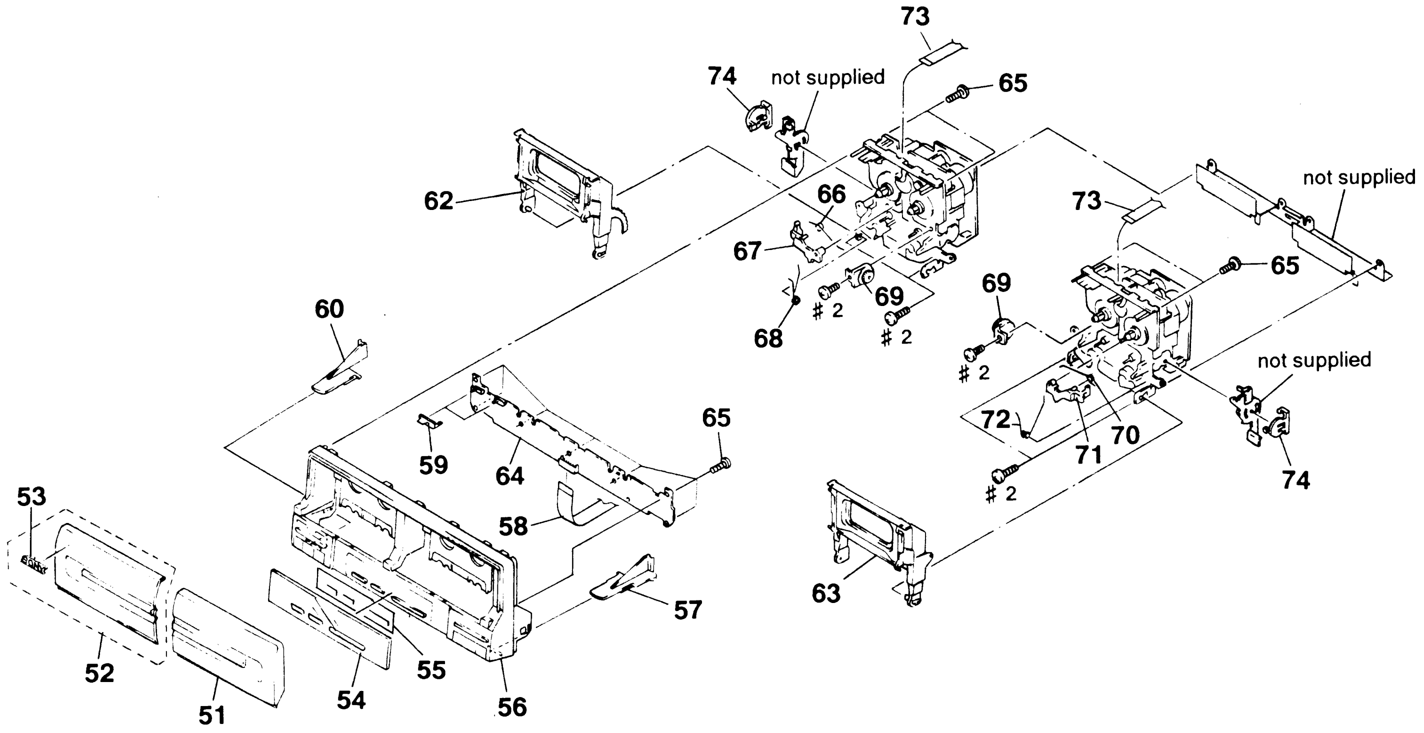
Ref. No.	Par
51	X-3
51	X-4
52	X-3
52	X-4
53	4-9
54	X-4
55	4-9
56	X-3
56	X-4
57	4-9
57	4-9
58	1-7
59	4-9
59	4-9
60	4-9
60	4-9

mark
⚠ are
umber



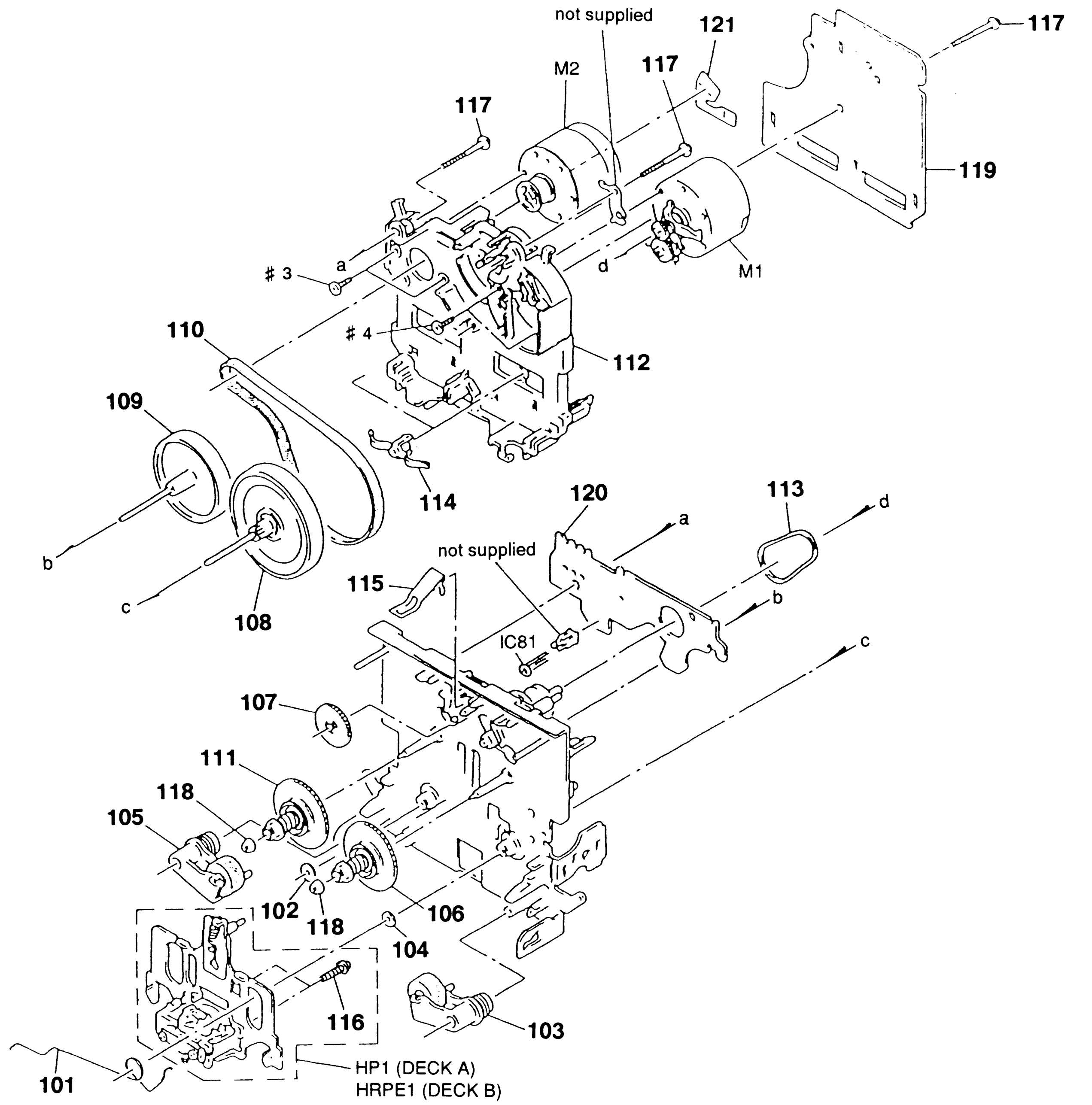
Remark

6-2. FRONT PANEL SECTION


73
74
not supplied
65
62
66
67
73
not supplied
65
69
68
# 2
69
# 2
60
69
# 2
not supplied
72
71
70
65
59
64
58
53
74
# 2
63
57
52
51
54
55
56

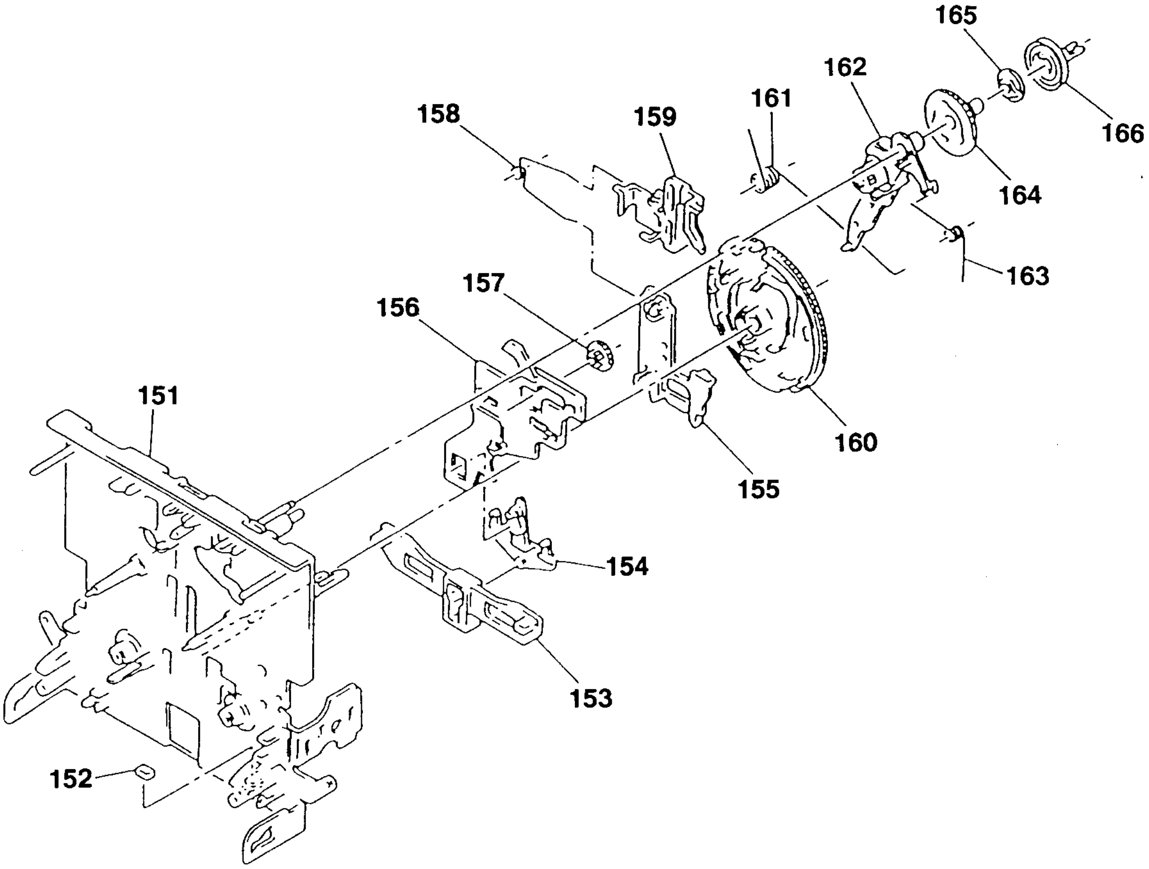
Ref. No.	Part No.	Description	Remark
51	X-3371-674-1	LID (B) ASSY, CASSETTE (BLACK)	
51	X-4946-613-1	LID (B) ASSY, CASSETTE (SILVER)	
52	X-3371-673-1	LID (A) ASSY, CASSETTE (BLACK)	
52	X-4946-612-1	LID (A) ASSY, CASSETTE (SILVER)	
53	4-962-708-11	EMBLEM (4-A), SONY	
54	X-4947-183-1	WINDOW ASSY	
55	4-978-257-01	ILLUMINATOR	
56	X-3371-672-1	PANEL ASSY, FRONT (BLACK)	
56	X-4946-611-1	PANEL ASSY, FRONT (SILVER)	
57	4-978-255-01	LEVER (EJECT-B) (SILVER)	
57	4-978-255-11	LEVER (EJECT-B) (BLACK)	
58	1-769-390-11	WIRE (FLAT TYPE) (17 CORE)	
59	4-978-256-01	KNOB (SLIDE) (SILVER)	
59	4-978-256-11	KNOB (SLIDE) (BLACK)	
60	4-978-254-01	LEVER (EJECT-A) (SILVER)	
60	4-978-254-11	LEVER (EJECT-A) (BLACK)	
62	X-3371-697-1	HOLDER (L) ASSY, CASSETTE (TH)	
62	X-3372-081-1	HOLDER (L) ASSY, CASSETTE (AEP, UK, E, EA)	
63	X-3371-698-1	HOLDER (R) ASSY, CASSETTE (TH)	
63	X-3372-082-1	HOLDER (R) ASSY, CASSETTE (AEP, UK, E, EA)	
* 64	A-2007-478-A	TC PANEL BOARD, COMPLETE	
65	4-951-620-01	SCREW (2.6X8), +BVTP	
66	3-354-961-01	SPRING (EJ SAFTY SPRING L)	
67	3-354-955-01	LEVER (EJ SAFTY LEVER L)	
68	4-959-231-11	SPRING (L), TORSION	
69	3-354-963-01	DAMPER	
70	3-354-962-01	SPRING (EJ SAFTY SPRING R)	
71	3-354-956-01	LEVER (EJ SAFTY LEVER R)	
72	4-959-232-11	SPRING (R), TORSION	
73	1-765-384-11	WIRE (FLAT TYPE) (7 CORE)	
74	3-354-957-01	JOINT (LOCK LEVER)	

6-3. MECHANISM SECTION-1
(DECK A: TCM-190RA12CL)
(DECK B: TCM-190RB52C)


not supplied
121
117
M2
117
117
119
# 3
a
d
M1
110
# 4
112
109
114
120
113
d
b
a
c
not supplied
115
108
IC81
b
c
107
111
118
105
102
118
106
104
116
103
101
HP1 (DECK A)
HRPE1 (DECK B)

Ref. No.	Part No.	Description	Remark
101	3-907-362-01	SPRING, TORSION	
102	3-356-714-01	WASHER	
103	X-3366-047-1	LEVER (PINCH F) ASSY	
104	3-356-713-01	WASHER	
105	X-3366-048-1	LEVER (PINCH R) ASSY	
106	X-3366-971-1	TABLE ASSY (B), REEL (DECK A)	
106	X-3369-508-1	TABLE (C) ASSY, REEL (DECK B)	
107	3-359-424-01	GEAR (REV GEAR)	
108	X-3367-629-1	FLYWHEEL (FWD) ASSY	
109	X-3359-410-1	FLYWHEEL (REV) ASSY (DECK A)	
109	X-3367-630-1	FLYWHEEL (REV) ASSY (DECK B)	
110	3-359-417-01	BELT (FLAT), CAPSTAN	
111	X-3366-970-1	TABLE ASSY, REEL	
112	3-359-436-11	BASE (THRUST RETAINER), FITTING	
113	3-359-466-01	BELT (FR), SQUARE	
114	3-575-321-00	RETAINER, THRUST, CAPSTAN	
115	3-359-430-01	SPRING (CASSETTE RETAINER), LEAF	
116	3-388-848-01	SCREW (P2X6) (B TIGHT)	
117	3-359-414-01	SCREW (+PTPWH 2X23)	
118	3-362-308-01	CAP (REEL)	
* 119	A-2007-266-A	AUDIO BOARD, COMPLETE (DECK A)	
* 119	A-2007-133-A	AUDIO BOARD, COMPLETE (DECK B)	
* 120	1-638-020-11	LEAF SW-A BOARD	
* 120	1-638-020-11	LEAF SW-B BOARD	
121	1-638-983-11	MOTOR FLEXIBLE BOARD	
HP1	A-2003-757-A	BASE ASSY, HEAD (PB) (DECK A)	
HRPE1	A-2003-930-A	BASE ASSY, HEAD (PB/REC/ERASE) (DECK A)	
IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(HI)	
M1	X-3363-501-2	MOTOR ASSY (REEL)	
M2	X-3365-377-2	MOTOR ASSY (CAPSTAN)	

6-4. MECHANISM SECTION-2
(DECK A: TCM-190RA12CL)
(DECK B: TCM-190RB52C)



Ref. No.	Part No.	Description	Remark
151	X-3359-415-1	CHASSIS ASSY, MECHANICAL	
152	3-359-469-01	SPACER	
153	3-359-425-01	SLIDER (REVERSE SLIDER)	
154	3-359-426-01	LEVER (REVERSE LEVER)	
155	3-359-427-01	SLIDER (LEVERSE SLIDER)	
* 156	3-359-415-01	SLIDER (TRIGGER SLIDER)(DECK A)	
156	3-359-415-11	SLIDER (TRIGGER SLIDER)(DECK B)	
157	3-359-448-01	GEAR (TRIGGER)	
158	3-359-454-01	SPRING, TORSION	
159	3-359-429-01	SLIDER (BRAKE PLATE)(DECK A)	
159	3-359-429-11	SLIDER (BRAKE PLATE)(DECK B)	
160	3-359-420-01	GEAR (CAM GEAR)	
161	3-359-456-01	SPRING(TRIGGER SPRING), TORSION	
162	X-3366-569-1	ARM ASSY, FR	
163	3-924-185-11	SPRING (FR ARM), TORSION	
164	3-359-419-11	GEAR (FR GEAR)	
165	3-359-421-01	CLUTCH (REEL DISK)	
166	3-359-418-01	PULLEY (FR PULLEY)	

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB..., uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description	Remark
*	A-2007-266-A	AUDIO BOARD, COMPLETE (DECK A) ******************************	
		< CAPACITOR >	
C11	1-163-131-00	CERAMIC CHIP 390PF 5%	50V
C12	1-136-157-00	FILM 0.022uF 5%	50V
C13	1-124-234-00	ELECT 22uF 20%	16V
C18	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
C21	1-163-131-00	CERAMIC CHIP 390PF 5%	50V
C22	1-136-157-00	FILM 0.022uF 5%	50V
C23	1-124-234-00	ELECT 22uF 20%	16V
C28	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
C31	1-124-234-00	ELECT 22uF 20%	16V
C32	1-124-234-00	ELECT 22uF 20%	16V
C72	1-109-889-11	ELECT 1uF 20%	50V
		< CONNECTOR >	
* CNJ31	1-580-782-11	CONNECTOR, BOARD TO BOARD	
CNJ72	1-764-902-11	CONNECTOR, FFC/FPC 4P	
* CNP32	1-580-772-11	PIN, CONNECTOR (PC BOARD) 4P	
* CNP71	1-564-719-11	PIN, CONNECTOR (SMALL TYPE) 3P	
		< IC >	
IC31	8-759-106-02	IC uPC4570G2	
		< JUMPER RESISTOR >	
JW1	1-216-295-91	CONDUCTOR, CHIP (2012)	
JW51	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW52	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW53	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW54	1-216-296-91	CONDUCTOR, CHIP (3216)	
		< TRANSISTOR >	
Q71	8-729-216-22	TRANSISTOR 2SA1162-G	
		< RESISTOR >	
R11	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R12	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R13	1-216-100-00	METAL GLAZE 130K 5% 1/10W	
R14	1-216-068-00	METAL CHIP 6.2K 5% 1/10W	
R21	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R22	1-216-025-91	METAL GLAZE 100 5% 1/10W	
R23	1-216-100-00	METAL GLAZE 130K 5% 1/10W	
R24	1-216-068-00	METAL CHIP 6.2K 5% 1/10W	
R31	1-216-033-00	METAL CHIP 220 5% 1/10W	
R32	1-216-033-00	METAL CHIP 220 5% 1/10W	
R71	1-216-082-00	METAL GLAZE 24K 5% 1/10W	
R72	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R73	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R74	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
		< VARIABLE RESISTOR >	
RV11	1-241-761-11	RES, ADJ, CARBON 1K	
RV21	1-241-761-11	RES, ADJ, CARBON 1K	
RV71	1-241-630-11	RES, ADJ, CARBON 10K	
RV72	1-241-630-11	RES, ADJ, CARBON 10K	
***			
*	A-2007-133-A	AUDIO BOARD, COMPLETE (DECK B) ******************************	
		< CAPACITOR >	
C11	1-163-131-00	CERAMIC CHIP 390PF 5%	50V
C12	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
C13	1-136-153-00	FILM 0.01uF 5%	50V
C14	1-126-177-11	ELECT 100uF 20%	10V
C15	1-124-234-00	ELECT 22uF 20%	16V
C16	1-136-434-11	FILM 120PF 5%	630V
C17	1-102-113-00	CERAMIC 390PF 10%	50V
C18	1-163-237-11	CERAMIC CHIP 27PF 5%	50V
C21	1-163-131-00	CERAMIC CHIP 390PF 5%	50V
C22	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
C23	1-136-153-00	FILM 0.01uF 5%	50V
C24	1-126-177-11	ELECT 100uF 20%	10V
C25	1-124-234-00	ELECT 22uF 20%	16V
C26	1-136-434-11	FILM 120PF 5%	630V
C27	1-102-113-00	CERAMIC 390PF 10%	50V
C28	1-163-237-11	CERAMIC CHIP 27PF 5%	50V
C31	1-124-234-00	ELECT 22uF 20%	16V
C32	1-124-234-00	ELECT 22uF 20%	16V
C33	1-124-234-00	ELECT 22uF 20%	16V
C51	1-164-182-11	CERAMIC CHIP 0.0033uF 10%	50V
C52	1-164-182-11	CERAMIC CHIP 0.0033uF 10%	50V
C53	1-163-019-00	CERAMIC CHIP 0.0068uF 10%	50V
C54	1-107-364-11	FILM 0.012uF 5%	100V

Ref. No.	Part No.	Description	Remark
C56	1-164-505-11	CERAMIC CHIP 2.2uF	16V
C57	1-164-346-11	CERAMIC CHIP 1uF	16V
C58	1-163-020-00	CERAMIC CHIP 0.0082uF 10%	50V
C72	1-109-889-11	ELECT 1uF 20%	50V
		< CONNECTOR >	
* CNJ31	1-580-782-11	CONNECTOR, BOARD TO BOARD	
* CNJ33	1-580-782-11	CONNECTOR, BOARD TO BOARD	
CNJ72	1-764-902-11	CONNECTOR, FFC/FPC 4P	
* CNP32	1-580-781-11	PIN, CONNECTOR (PC BOARD) 7P	
* CNP71	1-564-719-11	PIN, CONNECTOR (SMALL TYPE) 3P	
		< IC >	
IC31	8-759-249-21	IC uPC1330AGR	
IC32	8-759-106-02	IC uPC4570G2	
		< JUMPER RESISTOR >	
JW1	1-216-295-91	CONDUCTOR, CHIP (2012)	
JW2	1-216-295-91	CONDUCTOR, CHIP (2012)	
JW11	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW12	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW13	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW14	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW15	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW16	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW17	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW18	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW19	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW20	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW21	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW22	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW23	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW24	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW25	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW26	1-216-296-91	CONDUCTOR, CHIP (3216)	
JW27	1-216-296-91	CONDUCTOR, CHIP (3216)	
		< COIL >	
L11	1-410-780-11	INDUCTOR 27mH	
L21	1-410-780-11	INDUCTOR 27mH	
		< TRANSISTOR >	
Q51	8-729-111-29	TRANSISTOR 2SD1616A-K	
Q52	8-729-111-29	TRANSISTOR 2SD1616A-K	
Q53	8-729-111-29	TRANSISTOR 2SD1616A-K	
Q71	8-729-216-22	TRANSISTOR 2SA1162-G	
		< RESISTOR >	
R11	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R12	1-216-033-00	METAL CHIP 220 5% 1/10W	
R13	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R14	1-216-076-00	METAL CHIP 13K 5% 1/10W	
R15	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R16	1-249-430-11	CARBON 12K 5% 1/4W	
R21	1-216-099-00	METAL CHIP 120K 5% 1/10W	
R22	1-216-033-00	METAL CHIP 220 5% 1/10W	
R23	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R24	1-216-076-00	METAL CHIP 13K 5% 1/10W	
R25	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R26	1-249-430-11	CARBON 12K 5% 1/4W	
R31	1-216-033-00	METAL CHIP 220 5% 1/10W	
R32	1-216-033-00	METAL CHIP 220 5% 1/10W	
R33	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R41	1-249-393-11	CARBON 10 5% 1/4W	
R42	1-249-393-11	CARBON 10 5% 1/4W	
R51	1-216-091-00	METAL CHIP 56K 5% 1/10W	
R52	1-216-091-00	METAL CHIP 56K 5% 1/10W	
R53	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R54	1-216-309-00	METAL CHIP 5.6 5% 1/10W	
R55	1-216-309-00	METAL CHIP 5.6 5% 1/10W	
R56	1-216-298-00	METAL CHIP 2.2 5% 1/10W	
R71	1-216-082-00	METAL GLAZE 24K 5% 1/10W	
R72	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R73	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
R74	1-216-089-91	METAL GLAZE 47K 5% 1/10W	
		< VARIABLE RESISTOR >	
RV11	1-241-761-11	RES, ADJ, CARBON 1K	
RV12	1-238-551-11	RES, ADJ, CARBON 220K	
RV21	1-241-761-11	RES, ADJ, CARBON 1K	
RV22	1-238-551-11	RES, ADJ, CARBON 220K	
RV71	1-241-630-11	RES, ADJ, CARBON 10K	
RV72	1-241-630-11	RES, ADJ, CARBON 10K	
		< TRANSFORMER >	
T51	1-429-290-11	TRANSFORMER, BIAS OSCILLATION	

****

Ref. No.	Part No.	Description	Remark
*	1-638-020-11	LEAF SW-A BOARD ***************	
		< CONNECTOR >	
* CNP81	1-568-850-11	SOCKET, CONNECTOR 7P	
		< IC >	
IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(H1)	

LEAF SW-A | LEAF SW-B | TC MAIN

Ref.No.	Part No.	Description				Remark
		< RESISTOR >				
R84	1-249-417-11	CARBON	1K	5%	1/4W	
R85	1-249-408-11	CARBON	180	5%	1/4W	
		< SWITCH >				
S81	1-571-958-11	SWITCH, PUSH (1 KEY)				(STOP DET)
S82	1-571-281-21	SWITCH, LEAF				(CrO2 DET)
S86	1-571-281-21	SWITCH, LEAF				(HALF DET)

****

Ref.No.	Part No.	Description				Remark
*	1-638-020-11	LEAF SW-B BOARD ***************				
		< CONNECTOR >				
* CNP81	1-568-850-11	SOCKET, CONNECTOR 7P				
		< IC >				
IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(H1)				
		< RESISTOR >				
R81	1-249-414-11	CARBON	560	5%	1/4W	
R82	1-247-818-11	CARBON	300	5%	1/4W	
R83	1-247-834-11	CARBON	1.3K	5%	1/4W	
R84	1-249-417-11	CARBON	1K	5%	1/4W	
R85	1-249-408-11	CARBON	180	5%	1/4W	
		< SWITCH >				
S81	1-571-958-11	SWITCH, PUSH (1 KEY)				(STOP DET)
S82	1-571-281-21	SWITCH, LEAF				(CrO2 DET)
S83	1-571-281-21	SWITCH, LEAF				(METAL DET)
S84	1-571-281-21	SWITCH, LEAF				(ERASE PROOF (A))
S85	1-571-281-21	SWITCH, LEAF				(ERASE PROOF (B))
S86	1-571-281-21	SWITCH, LEAF				(HALF DET)

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Ref.No.	Part No.	Description				Remark
*	A-2007-477-A	TC MAIN BOARD, COMPLETE **********************				
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S				
		< CAPACITOR >				
C102	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C103	1-162-282-31	CERAMIC	100PF	10%	50V	
C104	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C105	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C106	1-126-961-11	ELECT	2.2uF	20%	50V	
C107	1-136-174-00	FILM	0.56uF	5%	50V	
C108	1-136-171-00	FILM	0.33uF	5%	50V	
C109	1-126-961-11	ELECT	2.2uF	20%	50V	

Ref.No.	Part No.	Description				Remark
C110	1-126-961-11	ELECT	2.2uF	20%	50V	
C111	1-162-282-31	CERAMIC	100PF	10%	50V	
C114	1-124-907-11	ELECT	10uF	20%	50V	
C115	1-124-443-00	ELECT	100uF	20%	10V	
C116	1-162-282-31	CERAMIC	100PF	10%	50V	
C119	1-124-902-00	ELECT	0.47uF	20%	50V	
C120	1-126-963-11	ELECT	4.7uF	20%	50V	
C130	1-162-282-31	CERAMIC	100PF	10%	50V	
C131	1-162-282-31	CERAMIC	100PF	10%	50V	
C132	1-124-903-11	ELECT	1uF	20%	50V	
C133	1-162-286-31	CERAMIC	220PF	10%	50V	
C202	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C203	1-162-282-31	CERAMIC	100PF	10%	50V	
C204	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C205	1-130-475-00	MYLAR	0.0022uF	5%	50V	
C206	1-126-961-11	ELECT	2.2uF	20%	50V	
C207	1-136-174-00	FILM	0.56uF	5%	50V	
C208	1-136-171-00	FILM	0.33uF	5%	50V	
C209	1-126-961-11	ELECT	2.2uF	20%	50V	
C210	1-126-961-11	ELECT	2.2uF	20%	50V	
C211	1-162-282-31	CERAMIC	100PF	10%	50V	
C214	1-124-907-11	ELECT	10uF	20%	50V	
C215	1-124-443-00	ELECT	100uF	20%	10V	
C216	1-162-282-31	CERAMIC	100PF	10%	50V	
C219	1-124-902-00	ELECT	0.47uF	20%	50V	
C220	1-126-963-11	ELECT	4.7uF	20%	50V	
C230	1-162-282-31	CERAMIC	100PF	10%	50V	
C231	1-162-282-31	CERAMIC	100PF	10%	50V	
C232	1-124-903-11	ELECT	1uF	20%	50V	
C233	1-162-286-31	CERAMIC	220PF	10%	50V	
C502	1-126-944-11	ELECT	3300uF	20%	16V	
C504	1-126-944-11	ELECT	3300uF	20%	16V	
C518	1-124-907-11	ELECT	10uF	20%	50V	
C519	1-124-907-11	ELECT	10uF	20%	50V	
C529	1-136-157-00	FILM	0.022uF	5%	50V	
C530	1-136-157-00	FILM	0.022uF	5%	50V	
C533	1-136-157-00	FILM	0.022uF	5%	50V	
C534	1-136-157-00	FILM	0.022uF	5%	50V	
C535	1-126-942-61	ELECT	1000uF	20%	16V	
C536	1-126-942-61	ELECT	1000uF	20%	16V	
C537	1-124-472-11	ELECT	470uF	20%	10V	
C538	1-124-472-11	ELECT	470uF	20%	10V	
C540	1-126-926-11	ELECT	1000uF	20%	10V	
C601	1-124-443-00	ELECT	100uF	20%	10V	
C602	1-164-159-11	CERAMIC	0.1uF		50V	
C603	1-162-282-31	CERAMIC	100PF	10%	50V	
C604	1-164-159-11	CERAMIC	0.1uF		50V	
C606	1-124-480-11	ELECT	470uF	20%	25V	
C607	1-124-480-11	ELECT	470uF	20%	25V	
C608	1-124-480-11	ELECT	470uF	20%	25V	

Ref.No.	Part No.	Description			Remark
C609	1-124-902-00	ELECT	0.47uF	20%	50V
C610	1-124-472-11	ELECT	470uF	20%	10V
C611	1-162-290-31	CERAMIC	470PF	10%	50V
C612	1-124-472-11	ELECT	470uF	20%	10V
C613	1-162-290-31	CERAMIC	470PF	10%	50V
C614	1-164-159-11	CERAMIC	0.1uF		50V
C615	1-164-159-11	CERAMIC	0.1uF		50V
C616	1-124-910-11	ELECT	47uF	20%	50V
C617	1-164-159-11	CERAMIC	0.1uF		50V
C620	1-124-907-11	ELECT	10uF	20%	50V
C621	1-124-907-11	ELECT	10uF	20%	50V
C622	1-124-477-11	ELECT	47uF	20%	25V
C623	1-124-477-11	ELECT	47uF	20%	25V
C630	1-126-963-11	ELECT	4.7uF	20%	50V
C631	1-124-903-11	ELECT	1uF	20%	50V
C636	1-126-965-11	ELECT	22uF	20%	50V
C641	1-126-963-11	ELECT	4.7uF	20%	50V
C642	1-124-902-00	ELECT	0.47uF	20%	50V
C645	1-124-907-11	ELECT	10uF	20%	50V
C646	1-126-961-11	ELECT	2.2uF	20%	50V
C649	1-124-907-11	ELECT	10uF	20%	50V
C650	1-126-965-11	ELECT	22uF	20%	50V
C651	1-124-443-00	ELECT	100uF	20%	10V
C800	1-162-286-31	CERAMIC	220PF	10%	50V
C6035	1-162-294-31	CERAMIC	0.001uF	10%	50V
		< CONNECTOR >			
CN601	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P			
* CN602	1-691-916-11	CONNECTOR, BOARD TO BOARD			
CN603	1-695-330-31	PIN, CONNECTOR (PC BOARD) 7P			
* CN604	1-691-916-11	CONNECTOR, BOARD TO BOARD			
* CN605	1-691-916-11	CONNECTOR, BOARD TO BOARD			
CN608	1-770-166-11	CONNECTOR, FFC/FPC 17P			
CN609	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)			
		< DIODE >			
D508	8-719-024-99	DIODE 11ES2-NTA2B			
D509	8-719-024-99	DIODE 11ES2-NTA2B			
D510	8-719-024-99	DIODE 11ES2-NTA2B			
D511	8-719-024-99	DIODE 11ES2-NTA2B			
D512	8-719-024-99	DIODE 11ES2-NTA2B			
D513	8-719-024-99	DIODE 11ES2-NTA2B			
D519	8-719-024-99	DIODE 11ES2-NTA2B			
D522	8-719-024-99	DIODE 11ES2-NTA2B			
D523	8-719-987-63	DIODE 1N4148M			
D524	8-719-987-63	DIODE 1N4148M			
D525	8-719-024-99	DIODE 11ES2-NTA2B			
D526	8-719-024-99	DIODE 11ES2-NTA2B			
D601	8-719-987-63	DIODE 1N4148M			
D602	8-719-987-63	DIODE 1N4148M			

Ref.No.	Part No.	Description	Remark
D603	8-719-987-63	DIODE 1N4148M	
D604	8-719-987-63	DIODE 1N4148M	
D605	8-719-024-99	DIODE 11ES2-NTA2B	
D606	8-719-024-99	DIODE 11ES2-NTA2B	
D607	8-719-987-63	DIODE 1N4148M	
D608	8-719-987-63	DIODE 1N4148M	
D610	8-719-024-99	DIODE 11ES2-NTA2B	
D611	8-719-987-63	DIODE 1N4148M	
D620	8-719-012-68	DIODE UZ-2.7BSA-TP	
		< IC >	
IC101	8-752-058-57	IC CXA1599Q	
IC102	8-759-939-73	IC BA3308	
IC103	8-752-059-55	IC CXA1331S	
IC104	8-759-337-73	IC M38123M4-118FP	
IC502	8-759-231-53	IC TA7805S	
IC503	8-759-604-86	IC M5F7807L	
IC504	8-759-604-90	IC M5F7907L	
IC505	8-759-604-86	IC M5F7807L	
IC506	8-759-604-90	IC M5F7907L	
IC602	8-759-256-72	IC PST994D	
IC603	8-759-266-35	IC TA8242AK	
IC6004	8-759-000-48	IC MC14052BCP	
		< COIL >	
L601	1-414-189-31	INDUCTOR 100uH	
L6002	1-414-183-41	INDUCTOR 10uH	
		< JACK >	
PJ101	1-695-188-31	JACK, PIN 4P (TAPE IN/OUT)	
		< TRANSISTOR >	
Q101	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q122	8-729-900-89	TRANSISTOR DTC144ES	
Q201	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q222	8-729-900-89	TRANSISTOR DTC144ES	
Q603	8-729-801-93	TRANSISTOR 2SD1387	
Q604	8-729-801-93	TRANSISTOR 2SD1387	
Q605	8-729-900-80	TRANSISTOR DTC114ES	
Q607	8-729-900-89	TRANSISTOR DTC144ES	
Q608	8-729-900-89	TRANSISTOR DTC144ES	
Q609	8-729-900-89	TRANSISTOR DTC144ES	
Q611	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q612	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q613	8-729-900-65	TRANSISTOR DTA144ES	
Q614	8-729-900-89	TRANSISTOR DTC144ES	
Q620	8-729-900-89	TRANSISTOR DTC144ES	
Q621	8-729-900-65	TRANSISTOR DTA144ES	
Q627	8-729-900-89	TRANSISTOR DTC144ES	

TC MAIN

Ref. No.	Part No.	Description				Remark
Q630	8-729-422-57	TRANSISTOR	UN4111			
Q802	8-729-900-80	TRANSISTOR	DTC114ES			
Q803	8-729-900-80	TRANSISTOR	DTC114ES			
Q804	8-729-900-80	TRANSISTOR	DTC114ES			
Q805	8-729-900-80	TRANSISTOR	DTC114ES			
		< RESISTOR >				
R106	1-249-418-11	CARBON	1.2K	5%	1/4W	
R107	1-247-864-11	CARBON	24K	5%	1/4W	
R108	1-249-414-11	CARBON	560	5%	1/4W	
R109	1-249-429-11	CARBON	10K	5%	1/4W	
R110	1-249-427-11	CARBON	6.8K	5%	1/4W	
R111	1-249-427-11	CARBON	6.8K	5%	1/4W	
R112	1-247-832-11	CARBON	1.1K	5%	1/4W	
R113	1-249-429-11	CARBON	10K	5%	1/4W	
R114	1-249-421-11	CARBON	2.2K	5%	1/4W	
R115	1-247-887-00	CARBON	220K	5%	1/4W	
R116	1-249-437-11	CARBON	47K	5%	1/4W	
R117	1-249-419-11	CARBON	1.5K	5%	1/4W	
R118	1-249-438-11	CARBON	56K	5%	1/4W	
R119	1-247-834-11	CARBON	1.3K	5%	1/4W	
R120	1-247-807-31	CARBON	100	5%	1/4W	
R121	1-247-807-31	CARBON	100	5%	1/4W	
R122	1-249-426-11	CARBON	5.6K	5%	1/4W	
R206	1-249-418-11	CARBON	1.2K	5%	1/4W	
R207	1-247-864-11	CARBON	24K	5%	1/4W	
R208	1-249-414-11	CARBON	560	5%	1/4W	
R209	1-249-429-11	CARBON	10K	5%	1/4W	
R210	1-249-427-11	CARBON	6.8K	5%	1/4W	
R211	1-249-427-11	CARBON	6.8K	5%	1/4W	
R212	1-247-832-11	CARBON	1.1K	5%	1/4W	
R213	1-249-429-11	CARBON	10K	5%	1/4W	
R214	1-249-421-11	CARBON	2.2K	5%	1/4W	
R215	1-247-887-00	CARBON	220K	5%	1/4W	
R216	1-249-437-11	CARBON	47K	5%	1/4W	
R217	1-249-419-11	CARBON	1.5K	5%	1/4W	
R218	1-249-438-11	CARBON	56K	5%	1/4W	
R219	1-247-834-11	CARBON	1.3K	5%	1/4W	
R220	1-247-807-31	CARBON	100	5%	1/4W	
R221	1-247-807-31	CARBON	100	5%	1/4W	
R222	1-249-426-11	CARBON	5.6K	5%	1/4W	
R504	1-247-807-31	CARBON	100	5%	1/4W	
R505	1-249-429-11	CARBON	10K	5%	1/4W	
R601	1-247-807-31	CARBON	100	5%	1/4W	
R602	1-247-807-31	CARBON	100	5%	1/4W	
R606	1-249-435-11	CARBON	33K	5%	1/4W	
R607	1-247-807-31	CARBON	100	5%	1/4W	
R615	1-247-807-31	CARBON	100	5%	1/4W	
R616	1-249-433-11	CARBON	22K	5%	1/4W	
R620	1-249-429-11	CARBON	10K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
⚠R621	1-212-853-00	FUSIBLE	6.8	5%	1/4W	F
R622	1-249-421-11	CARBON	2.2K	5%	1/4W	
R623	1-249-421-11	CARBON	2.2K	5%	1/4W	
R624	1-249-434-11	CARBON	27K	5%	1/4W	
R625	1-249-421-11	CARBON	2.2K	5%	1/4W	
R626	1-249-421-11	CARBON	2.2K	5%	1/4W	
R627	1-249-421-11	CARBON	2.2K	5%	1/4W	
R628	1-249-434-11	CARBON	27K	5%	1/4W	
R629	1-249-421-11	CARBON	2.2K	5%	1/4W	
R630	1-249-429-11	CARBON	10K	5%	1/4W	
R631	1-249-421-11	CARBON	2.2K	5%	1/4W	
R632	1-249-429-11	CARBON	10K	5%	1/4W	
R633	1-247-807-31	CARBON	100	5%	1/4W	
R634	1-247-807-31	CARBON	100	5%	1/4W	
R637	1-249-414-11	CARBON	560	5%	1/4W	
R640	1-249-429-11	CARBON	10K	5%	1/4W	
R641	1-247-807-31	CARBON	100	5%	1/4W	
R642	1-249-424-11	CARBON	3.9K	5%	1/4W	
R648	1-249-437-11	CARBON	47K	5%	1/4W	
R649	1-249-437-11	CARBON	47K	5%	1/4W	
R650	1-249-437-11	CARBON	47K	5%	1/4W	
R656	1-249-393-11	CARBON	10	5%	1/4W	
R660	1-249-417-11	CARBON	1K	5%	1/4W	
R661	1-249-434-11	CARBON	27K	5%	1/4W	
R670	1-249-433-11	CARBON	22K	5%	1/4W	
R673	1-249-429-11	CARBON	10K	5%	1/4W	
R674	1-247-860-11	CARBON	16K	5%	1/4W	
R675	1-249-429-11	CARBON	10K	5%	1/4W	
R676	1-249-434-11	CARBON	27K	5%	1/4W	
R677	1-247-807-31	CARBON	100	5%	1/4W	
R678	1-247-807-31	CARBON	100	5%	1/4W	
R679	1-247-807-31	CARBON	100	5%	1/4W	
R680	1-249-433-11	CARBON	22K	5%	1/4W	
R681	1-249-429-11	CARBON	10K	5%	1/4W	
R682	1-249-429-11	CARBON	10K	5%	1/4W	
R683	1-249-429-11	CARBON	10K	5%	1/4W	
R684	1-249-413-11	CARBON	470	5%	1/4W	
R685	1-249-429-11	CARBON	10K	5%	1/4W	
R686	1-249-429-11	CARBON	10K	5%	1/4W	
R687	1-249-417-11	CARBON	1K	5%	1/4W	
R689	1-247-872-11	CARBON	51K	5%	1/4W	
R690	1-249-429-11	CARBON	10K	5%	1/4W	
R691	1-249-429-11	CARBON	10K	5%	1/4W	
R693	1-249-433-11	CARBON	22K	5%	1/4W	
R694	1-249-433-11	CARBON	22K	5%	1/4W	
R695	1-249-421-11	CARBON	2.2K	5%	1/4W	
R696	1-249-421-11	CARBON	2.2K	5%	1/4W	
R700	1-247-903-00	CARBON	1M	5%	1/4W	
R701	1-249-429-11	CARBON	10K	5%	1/4W	
R702	1-249-437-11	CARBON	47K	5%	1/4W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
R801	1-249-429-11	CARBON 10K 5% 1/4W	
R802	1-247-807-31	CARBON 100 5% 1/4W	
R803	1-247-807-31	CARBON 100 5% 1/4W	
R804	1-247-807-31	CARBON 100 5% 1/4W	
R805	1-247-807-31	CARBON 100 5% 1/4W	
R807	1-249-433-11	CARBON 22K 5% 1/4W	
R808	1-249-429-11	CARBON 10K 5% 1/4W	
R809	1-249-429-11	CARBON 10K 5% 1/4W	
R810	1-249-429-11	CARBON 10K 5% 1/4W	
R813	1-249-411-11	CARBON 330 5% 1/4W	
R814	1-249-411-11	CARBON 330 5% 1/4W	
R815	1-249-411-11	CARBON 330 5% 1/4W	
R816	1-249-411-11	CARBON 330 5% 1/4W	
R817	1-249-411-11	CARBON 330 5% 1/4W	
R818	1-249-435-11	CARBON 33K 5% 1/4W	
R819	1-249-393-11	CARBON 10 5% 1/4W	
R820	1-249-417-11	CARBON 1K 5% 1/4W	
R821	1-249-417-11	CARBON 1K 5% 1/4W	
R822	1-249-417-11	CARBON 1K 5% 1/4W	
R823	1-249-425-11	CARBON 4.7K 5% 1/4W	
R6070	1-249-421-11	CARBON 2.2K 5% 1/4W	
R6071	1-249-421-11	CARBON 2.2K 5% 1/4W	

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV101	1-238-600-11	RES, ADJ, CARBON 10K	
RV201	1-238-600-11	RES, ADJ, CARBON 10K	

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X601	1-577-358-21	VIBRATOR, CERAMIC (4MHz)	

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* A-2007-478-A TC PANEL BOARD, COMPLETE

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< CONNECTOR >

Ref. No.	Part No.	Description	Remark
CN900	1-770-169-11	CONNECTOR, FFC/FPC 17P	

< DIODE >

Ref. No.	Part No.	Description	Remark
D900	8-719-046-43	DIODE SEL5421E-TP15 (▷ DECK A)	
D901	8-719-046-43	DIODE SEL5421E-TP15 (◁ DECK A)	
D902	8-719-046-43	DIODE SEL5421E-TP15 (▷ DECK B)	
D903	8-719-046-43	DIODE SEL5421E-TP15 (◁ DECK B)	
D906	8-719-046-44	DIODE SEL5221S (CD SYNC)	
D907	8-719-046-44	DIODE SEL5221S (HIGH)	
D908	8-719-046-44	DIODE SEL5221S (NORMAL)	
D909	8-719-046-36	DIODE SEL5921A-TP15 (❚❚)	
D910	8-719-046-44	DIODE SEL5221S (REC)	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R900	1-249-418-11	CARBON 1.2K 5% 1/4W	
R901	1-249-420-11	CARBON 1.8K 5% 1/4W	
R902	1-249-422-11	CARBON 2.7K 5% 1/4W	
R903	1-249-424-11	CARBON 3.9K 5% 1/4W	
R904	1-249-427-11	CARBON 6.8K 5% 1/4W	
R905	1-249-418-11	CARBON 1.2K 5% 1/4W	
R906	1-249-420-11	CARBON 1.8K 5% 1/4W	
R907	1-249-422-11	CARBON 2.7K 5% 1/4W	
R908	1-249-424-11	CARBON 3.9K 5% 1/4W	
R909	1-249-427-11	CARBON 6.8K 5% 1/4W	
R910	1-249-431-11	CARBON 15K 5% 1/4W	
R911	1-249-437-11	CARBON 47K 5% 1/4W	
R914	1-249-426-11	CARBON 5.6K 5% 1/4W	
R915	1-249-434-11	CARBON 27K 5% 1/4W	
R916	1-249-425-11	CARBON 4.7K 5% 1/4W	

< SWITCH >

Ref. No.	Part No.	Description	Remark
S900	1-762-205-11	SWITCH, SLIDE (DIRECTION MODE)	
S901	1-762-205-11	SWITCH, SLIDE (DOLBY NR)	
S902	1-554-303-21	SWITCH, TACTILE (■ DECK B)	
S903	1-554-303-21	SWITCH, TACTILE (▷ DECK B)	
S904	1-554-303-21	SWITCH, TACTILE (◁ DECK B)	
S905	1-554-303-21	SWITCH, TACTILE (❚❚ PAUSE, DECK B)	
S906	1-554-303-21	SWITCH, TACTILE (◀◀ DECK A)	
S907	1-554-303-21	SWITCH, TACTILE (▶▶ DECK A)	
S908	1-554-303-21	SWITCH, TACTILE (■ DECK A)	
S909	1-554-303-21	SWITCH, TACTILE (▷ DECK A)	
S910	1-554-303-21	SWITCH, TACTILE (◁ DECK A)	
S911	1-554-303-21	SWITCH, TACTILE (◀◀ DECK B)	
S912	1-554-303-21	SWITCH, TACTILE (▶▶ DECK B)	
S913	1-554-303-21	SWITCH, TACTILE (● REC)	
S915	1-554-303-21	SWITCH, TACTILE (DUBBING MODE)	
S916	1-554-303-21	SWITCH, TACTILE (CD SYNC)	
S917	1-554-303-21	SWITCH, TACTILE (○ REC MUTE)	

****

MISCELLANEOUS

****

Ref. No.	Part No.	Description	Remark
58	1-769-390-11	WIRE (FLAT TYPE) (17 CORE)	
73	1-765-384-11	WIRE (FLAT TYPE) (7 CORE)	
HP1	A-2003-757-A	BASE ASSY, HEAD (PB) (DECK A)	
HRPE1	A-2003-930-A	BASE ASSY, HEAD (PB/REC/ERASE) (DECK A)	
IC81	8-749-924-10	IC PHONT REFLECTOR NJL5165K-B(HI)	
M1	X-3363-501-2	MOTOR ASSY (REEL)	
M2	X-3365-377-2	MOTOR ASSY (CAPSTAN)	

****

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS *******************************	
*	3-933-134-01	CUSHION (LOWER)	
*	3-933-164-01	CUSHION (UPPER)	

****

****

HARDWARE LIST

****

#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#2	7-621-770-67	SCREW +BVTT 2.6X6 (S)	
#3	7-621-775-00	SCREW +B 2.6X3	
#4	7-627-556-08	SCREW +P 2.6X2.8	
#5	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	

9-960-500-11

Sony Corporation

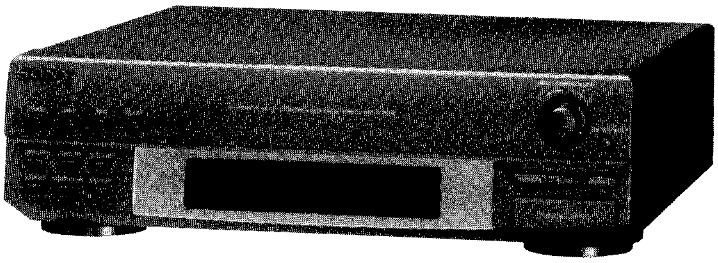
Consumer A&V Products Company
Home A&V Products Div.

English
96B0978-1
Printed in Japan
© 1996. 2
Published by Home A&V Products Div.
Quality Engineering Dept.

ST-EX100

SERVICE MANUAL

AEP Model
UK Model
E Model



This set is the tuner section in MHC-EX50/EX70AV/EX90/EX100AV.

Photo : E mode (SILVER)

SPECIFICATIONS

FM stereo, FM/AM superheterodyne tuner

FM tuner section

Tuning range 87.5 – 108.0 MHz (50 kHz step)
Aerial FM lead aerial
Aerial terminals 75 ohm unbalanced
Intermediate frequency 10.7 MHz

AM tuner section

Tuning range
  Italian model:
    AM: 522 – 1,611 kHz (with the interval set at 9 kHz)
  German model:
    AM: 531 – 1,602 kHz (with the interval set at 9 kHz)
E, Saudi Arabia, Thailand models:
    AM: 531 – 1,602 kHz (with the interval set at 9 kHz)
    530 – 1,710 kHz (with the interval set at 10 kHz)
  Other models:
    MW: 531 – 1,602 kHz (with the interval set at 9 kHz)
    LW: 153 – 279 kHz (with the interval set at 3 kHz)
Aerial AM loop aerial, External aerial terminals
Intermediate frequency 450 kHz
Dimensions
  Approx. 280 x 82.5 x 285 mm (11 1/8 x 3 1/4 x 11 1/4 in) (w/h/d) incl. projecting parts and controls
Mass Approx. 1.5 kg (3 lb 4 oz)

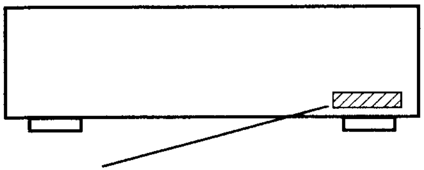
MICROFILM

FM STEREO/FM-AM TIMER TUNER

SONY®

MODEL IDENTIFICATION

— Back Panel —



4-978-999-0□...E model
4-978-999-1□...AEP, UK, German, Italian, CIS model (Made in France)
4-978-999-2□...AEP, UK model (Made in Malaysia)
4-978-999-3□...Saudi Arabia model
4-978-999-4□...Thailand model

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• IC201 System Control (µPD78013GC) 17

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SAFETY-RELATED COMPONENT WARNING !!

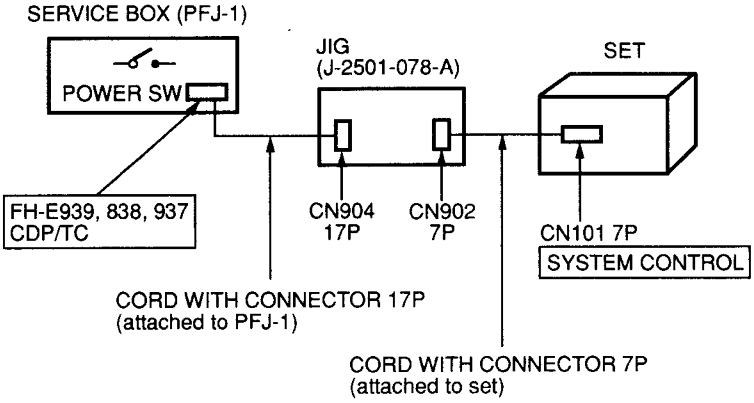
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

SECTION 1

SERVICING NOTE

How to operate with a single unit.

Normally, this set is not operated with its own.
The exclusive jig (J-2501-078-A) and service box (PFJ-1) are necessary to operate the set with a single unit.
Turn the power set of the service box ON. Then press the ENTER/NEXT button and SLEEP button at the same time to turn the power on.



SERVICE BOX (PFJ-1)
POWER SW
FH-E939, 838, 937
CDP/TC
JIG
(J-2501-078-A)
CN904
17P
CN902
7P
SET
CN101 7P
SYSTEM CONTROL
CORD WITH CONNECTOR 17P
(attached to PFJ-1)
CORD WITH CONNECTOR 7P
(attached to set)

• KEY/FL tube/LED check mode.

To enter KEY/FL/LED check mode, press the ENTER/NEXT and REC buttons at the same time.
Under mode, every time when press any key or turn MULTI CONTROLLER knob, change to next situation.

① All LED indicators light on
② All FL tube indicators light on
③ A part of FL tube light on mode 1. (Indicated ST-SEG)
④ A part of FL tube light on mode 2. (Indicated RDS-SEG)
⑤ KEY check mode

Note :

1) All LED light on mode is keeped, when buttons which is pressed to enter all LED light on mode, release same time.
   When release them separate timing, it is moved to next All LED light on mode.

2) After all LED light on mode, light on point remove one by one, when any button pressed or MULTI CONTROLLER knob turned.

3) Under KEY check mode, every time buttons pressed numerical value of “KEY” in FL tube increse.
   And that time, numerical value of “ECDR” increse when MULTI CONTROLLER button turn to + direction, and it decrese turn to – direction.

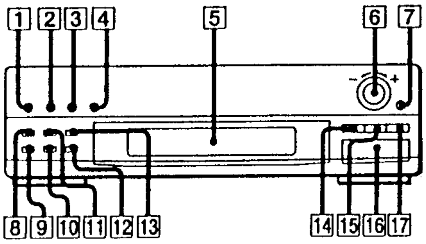
When you want to finish this mode, unplug the power of amplifire or turn off PFJ-1 of POWER switch.

SECTION 2
GENERAL

This section is extracted from instruction manual.

Index to Parts and Controls

Front Panel

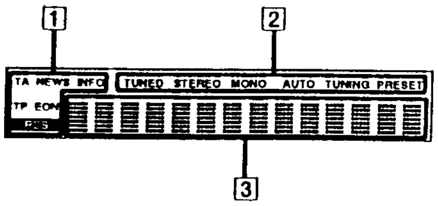


[1] ONCE button* (25, 26)
[2] DAILY button* (25, 26)
[3] REC button* (26)
[4] SLEEP button* (25)
[5] Display window (6, 10, 25)
[6] MULTI CONTROLLER*
(6, 10, 11, 13, 26)
[7] ENTER/NEXT button* (6, 11, 26)
[8] CHARACTER button (11)
[9] EON (Enhanced Other Networks)
button (12) (AEP, UK, G, IT)
MEMORY button (E, EA, CIS,TH)
[10] PTY (Programme Type) button (13)
(AEP, G, IT, UK)
STEREO/MONO button
(E, EA, CIS, TH)
[11] TIMER SET button (25)
[12] DISPLAY button (11, 12)
[13] CLOCK SET button (6)
[14] STEREO/MONO button (10)
MANUAL button (E, EA, CIS, TH)
[15] TUNING MODE button (10)
(AEP, UK, G, IT)
AUTO button
(E, EA, CIS, TH)
[16] TUNER/BAND button (10, 18, 30)
[17] MEMORY button (11)
(AEP, UK, G, IT)
PRESET button (E, EA, CIS, TH)

- Abbreviation

G	: German model.
IT	: Italian model.
EA	: Saudi Arabia model.
TH	: Thailand model

Display Window

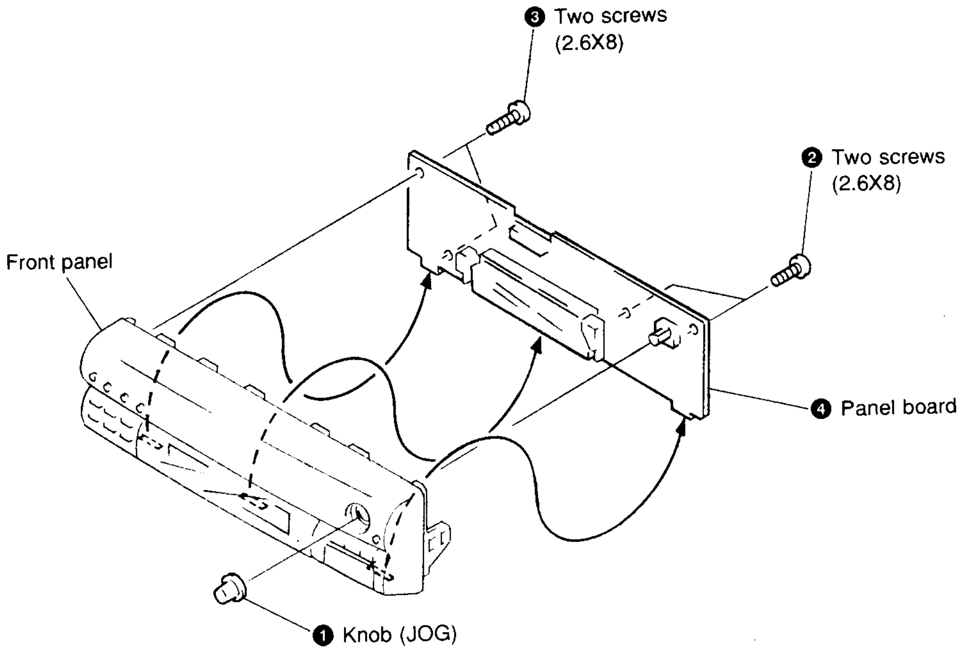


[1] RDS service indications (12) (AEP, UK, G, IT)
[2] Tuner indication (10)
[3] Frequency/station name/time/timer
indication (6, 10, 11, 25)

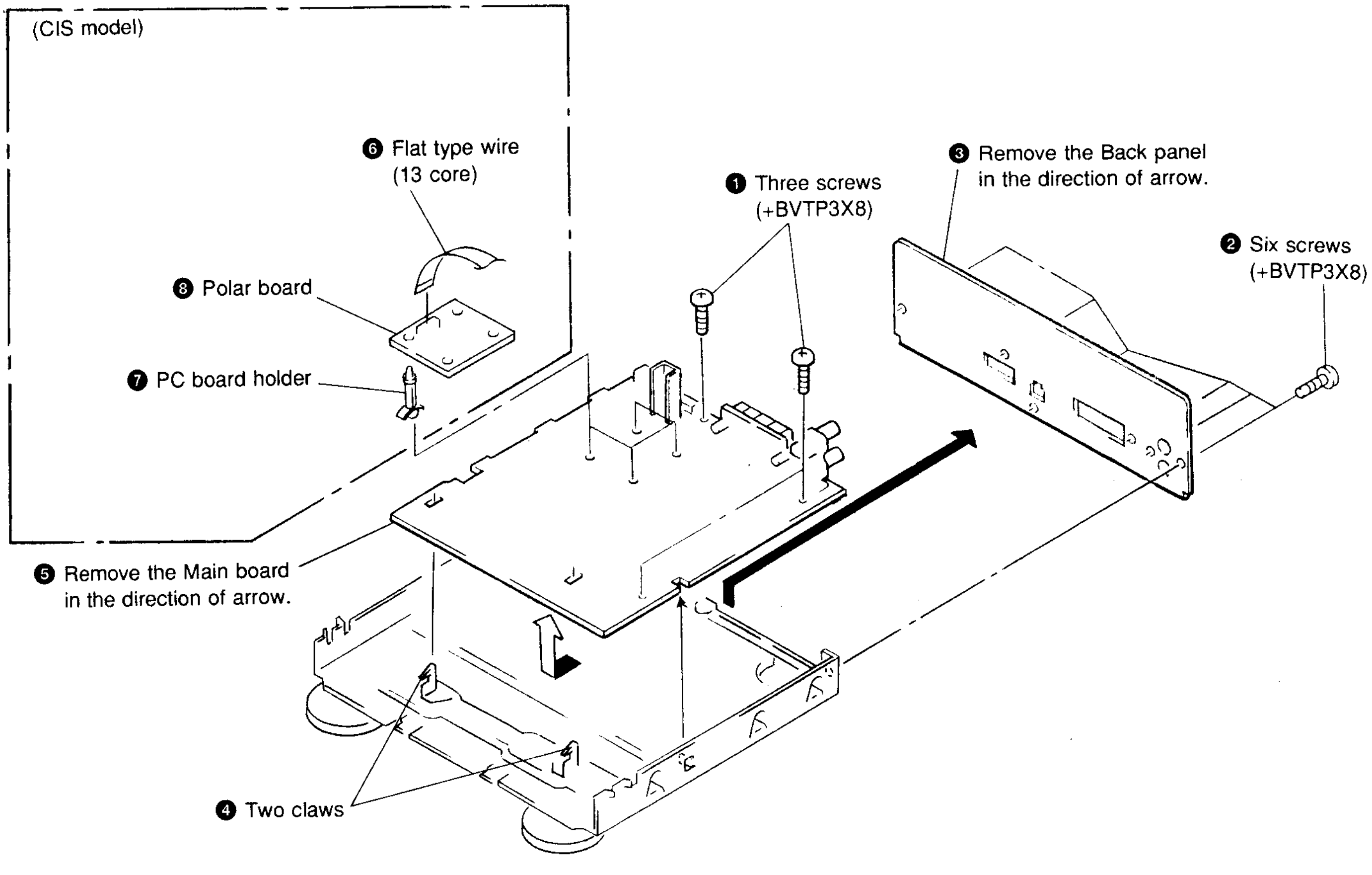
SECTION 3
DISASSEMBLY

Note : Follow the disassembly procedure in the numerical order given.

3-1. PANEL BOARD


❸ Two screws (2.6X8)
❷ Two screws (2.6X8)
Front panel
❹ Panel board
❶ Knob (JOG)

3-2. BACK PANEL, MAIN BOARD AND POLAR BOARD


(CIS model)
❻ Flat type wire (13 core)
❽ Polar board
❼ PC board holder
❶ Three screws (+BVTP3X8)
❸ Remove the Back panel in the direction of arrow.
❷ Six screws (+BVTP3X8)
❺ Remove the Main board in the direction of arrow.
❹ Two claws

SECTION 4

ELECTRICAL ADJUSTMENTS

Precautions in Repairing

If the front unit fails, it is difficult to repair the inner circuits, so replace the entire front end unit.

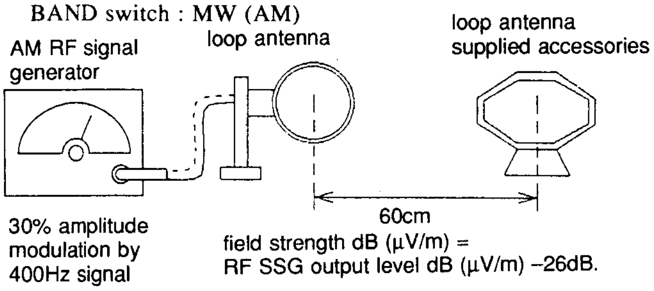
The FM TUNED level must be adjusted after the AM TUNED level adjustment has completed.

AM SECTION

AM Tuning Level Adjustment

Setting :

BAND switch : MW (AM)


AM RF signal generator
loop antenna
loop antenna supplied accessories
60cm
30% amplitude modulation by 400Hz signal
field strength dB (μV/m) = RF SSG output level dB (μV/m) −26dB.

Carrier frequency : 999kHz (at 9k step)
1,000kHz (at 10k step)
Output level : 25dBμ

Procedure :

1. Set loop antenna A so that the loop antenna B input level becomes 55dBμ/m.
2. Tune the set to 999kHz or 1,000 kHz.
3. Adjust RV1 so that the TUNED indicator goes on.

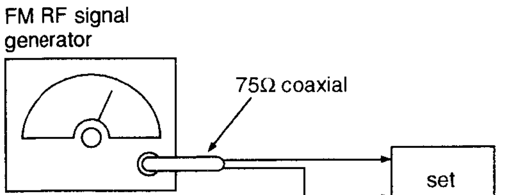
Adjustment Location : MAIN board. (See page 7)

FM SECTION

FM Tuning Level Adjustment

Setting :

BAND switch : FM


FM RF signal generator
75Ω coaxial
set
FM antenna terminal

Carrier frequency : 98MHz
Moduration : AUDIO 1kHz, 75kHz deviation (100%)
Output level : 26dBμ (17.8μV)

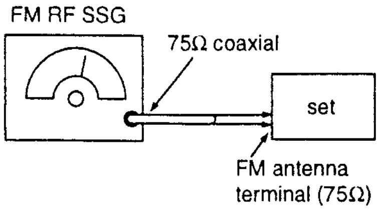
Procedure :

1. Tune the set to 98MHz.
2. Adjust RV2 so that the TUNED indicator goes on.

Adjustment Location : MAIN board. (See page 7)

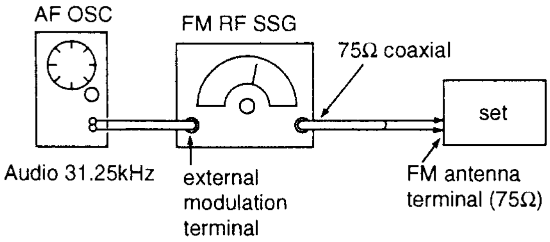
FM Polar Adjustment (CIS model only)

Connection 1 :


FM RF SSG
75Ω coaxial
set
FM antenna terminal (75Ω)

Carrier frequency : 69MHz
Output level : 1mV (60dBμ) (at 75Ω open)
Modulation : AUDIO 1kHz, 10kHz deviation

Connection 2 :


AF OSC
FM RF SSG
75Ω coaxial
set
Audio 31.25kHz
external modulation terminal
FM antenna terminal (75Ω)

Carrier frequency : 69MHz
Output level : 1mV (60dBμ) (at 75Ω open)
Modulation : AUDIO 31.25kHz, 10kHz deviation (EXTERNAL MODULATION)

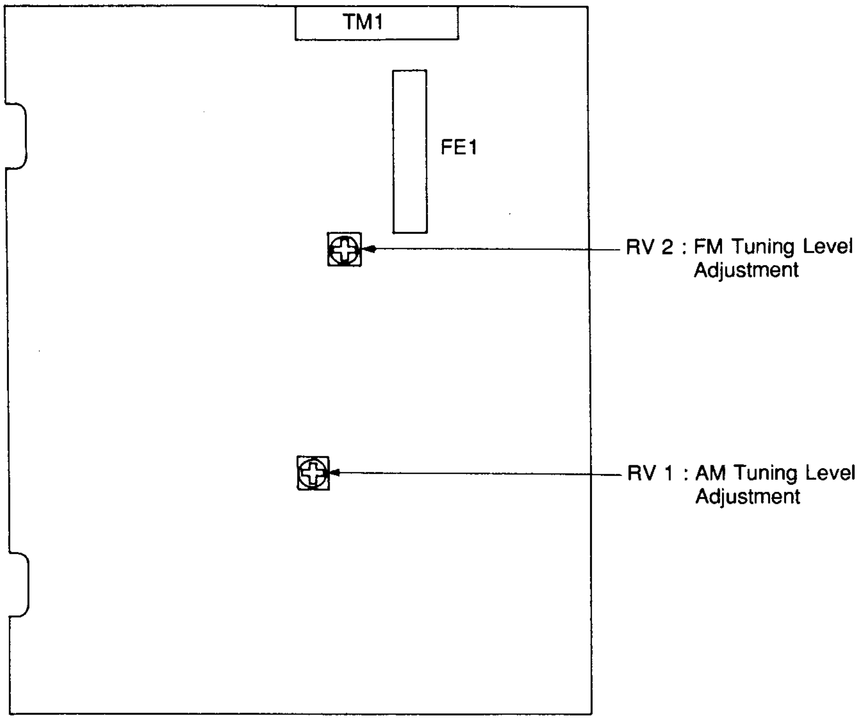
Procedure :

1. Set the modulation of FM RF SSG to AUDIO 1 kHz, 10 kHz deviation according to “Connection 1”.
2. Tune the set to 69 MHz.
3. Adjust the RV1702 so that the reading of frequency counter connected to TP1702 becomes within 31.25 kHz ± 0.05 kHz. (VCO frequency adjustment)
4. Then record the reading of the level meter connected to TP1701.
5. Set the modulation of FM RF SSG to AUDIO 31.25 kHz, 10 kHz deviation according to “Connection 2”.
6. Tune the set to 69 MHz.
7. Set the CT1701 to be mechanical center.
8. Adjust the L1701 so that the reading of the level meter connected to TP1701 becomes maximum.
   Then adjust the CT1701 so that the reading of the level meter connected to TP1701 becomes maximum. (SUB CARRIER PEAK Adjustment)
9. Adjust the RV1701 so that the level at the moment becomes 14 dB higher value than the level recorded in step 4. (SUB CARRIER LEVEL Adjustment)

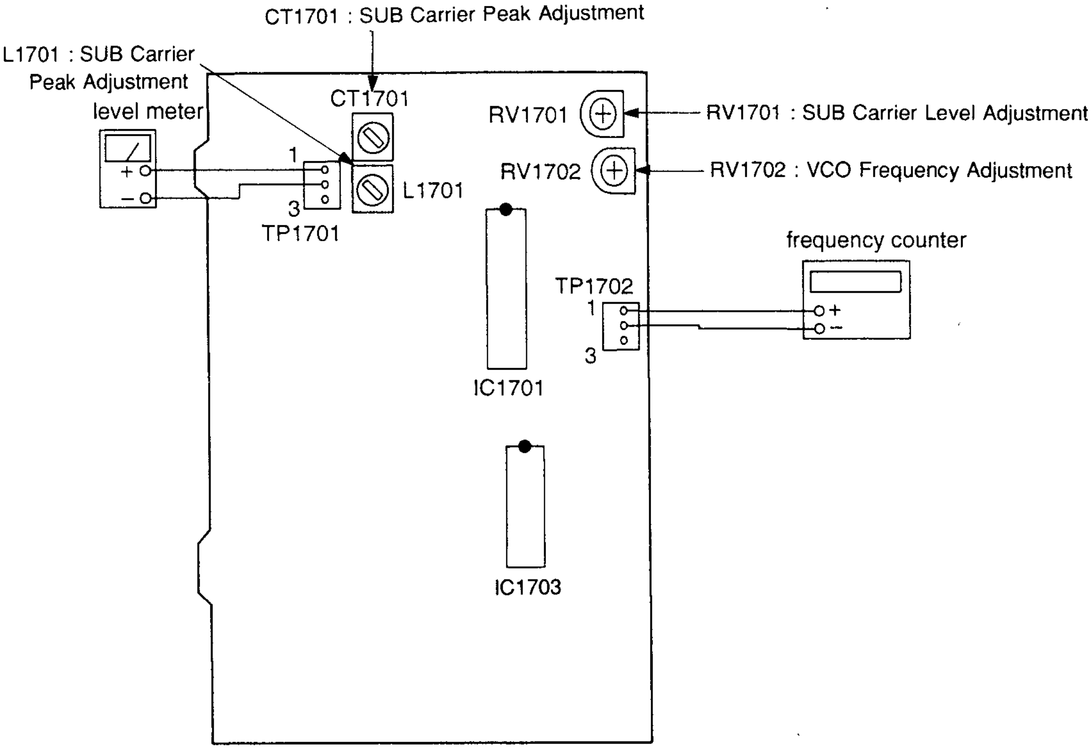
Adjustment Location : Polar board. (See page 7)

Adjustment Location

[MAIN BOARD] — Component side —


TM1
FE1
RV 2 : FM Tuning Level Adjustment
RV 1 : AM Tuning Level Adjustment

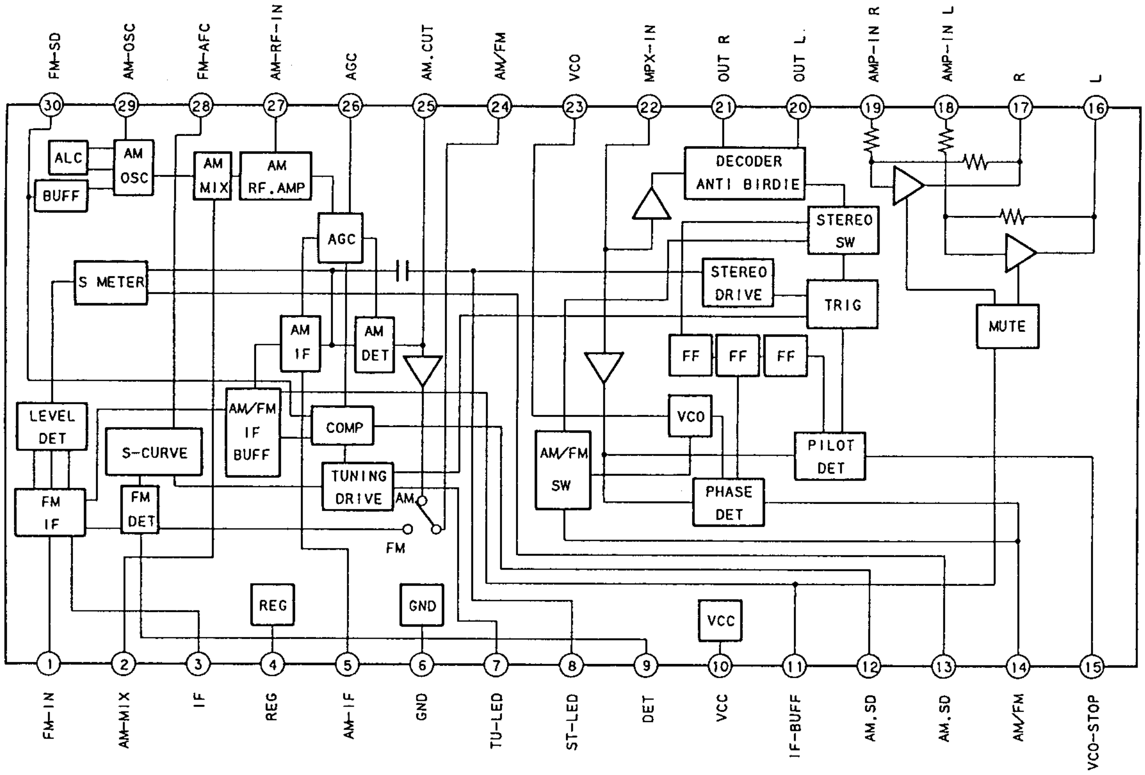
[POLAR BOARD] — Component side —


CT1701 : SUB Carrier Peak Adjustment
L1701 : SUB Carrier Peak Adjustment
level meter
+
−
1
3
TP1701
CT1701
L1701
RV1701
RV1702
RV1701 : SUB Carrier Level Adjustment
RV1702 : VCO Frequency Adjustment
frequency counter
TP1702
1
3
+
−
IC1701
IC1703

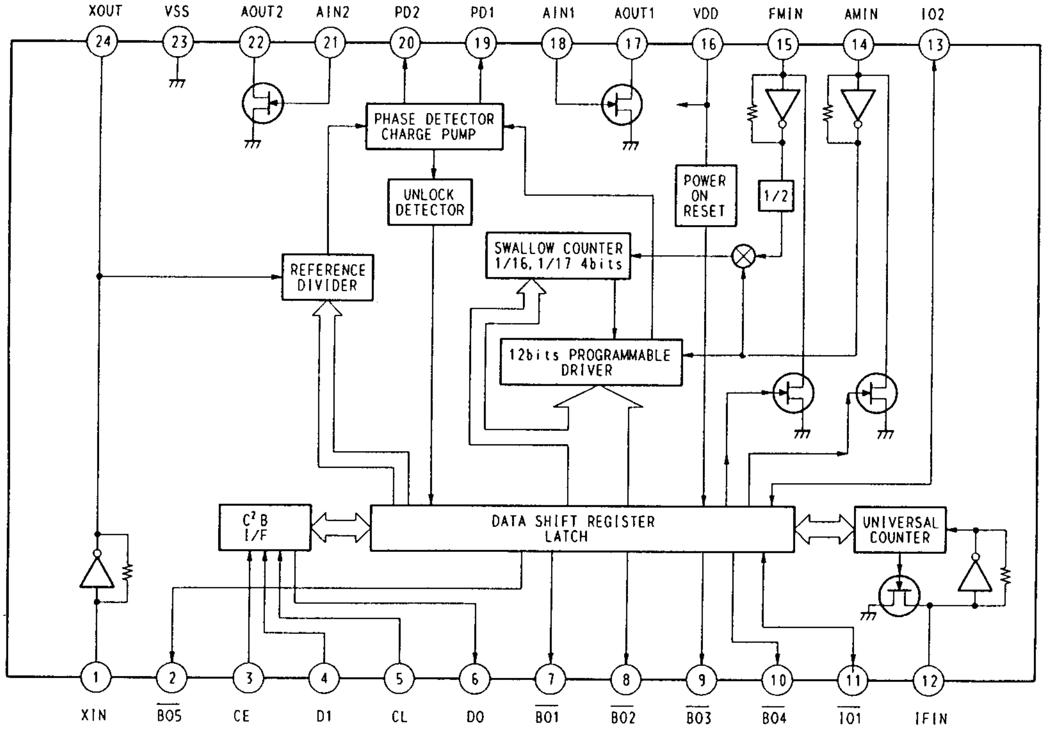
SECTION 5
DIAGRAMS

5-1. IC BLOCK DIAGRAMS

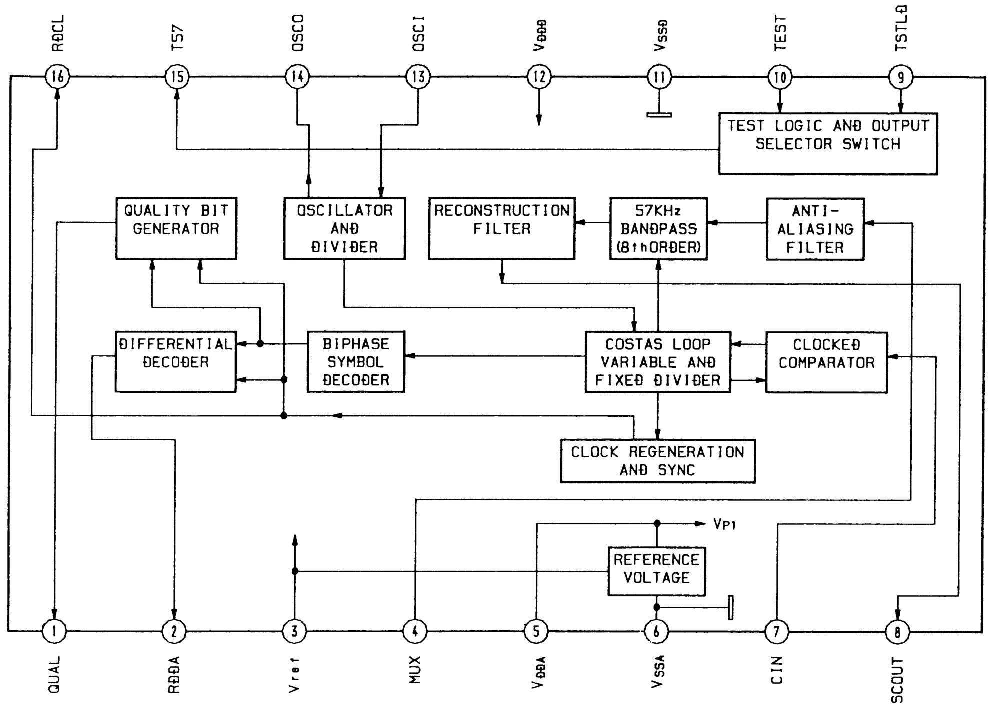
IC1 LA1835


FM-SD
AM-OSC
FM-AFC
AM-RF-IN
AGC
AM.CUT
AM/FM
VCO
MPX-IN
OUT R
OUT L
AMP-IN R
AMP-IN L
R
L
30
29
28
27
26
25
24
23
22
21
20
19
18
17
16
ALC
AM OSC
BUFF
AM MIX
AM RF.AMP
AGC
S METER
AM IF
AM DET
LEVEL DET
AM/FM IF BUFF
COMP
S-CURVE
TUNING DRIVE
AM
FM
FM IF
FM DET
DECODER ANTI BIRDIE
STEREO SW
STEREO DRIVE
TRIG
FF
FF
FF
VCO
AM/FM SW
PILOT DET
PHASE DET
MUTE
REG
GND
VCC
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
FM-IN
AM-MIX
IF
REG
AM-IF
GND
TU-LED
ST-LED
DET
VCC
IF-BUFF
AM.SD
AM.SD
AM/FM
VCO-STOP

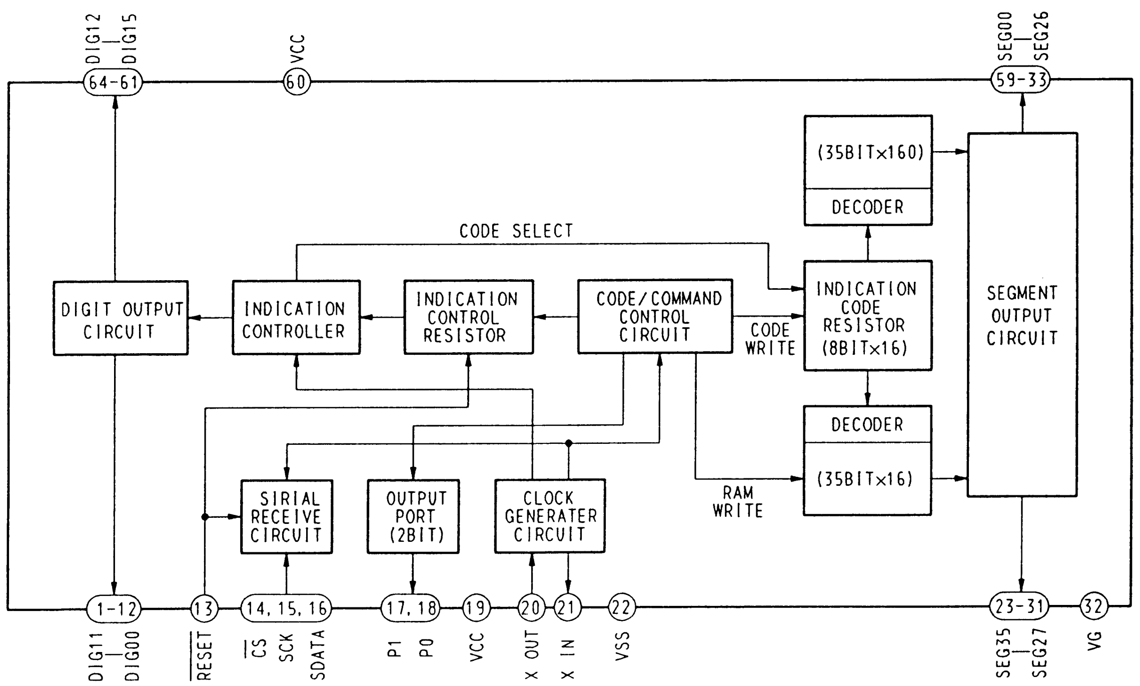
IC51 LC72130


XOUT
VSS
AOUT2
AIN2
PD2
PD1
AIN1
AOUT1
VDD
FMIN
AMIN
IO2
24
23
22
21
20
19
18
17
16
15
14
13
PHASE DETECTOR CHARGE PUMP
UNLOCK DETECTOR
POWER ON RESET
1/2
REFERENCE DIVIDER
SWALLOW COUNTER 1/16, 1/17 4bits
12bits PROGRAMMABLE DRIVER
C²B I/F
DATA SHIFT REGISTER LATCH
UNIVERSAL COUNTER
1
2
3
4
5
6
7
8
9
10
11
12
XIN
BO5
CE
DI
CL
DO
BO1
BO2
BO3
BO4
IO1
IFIN

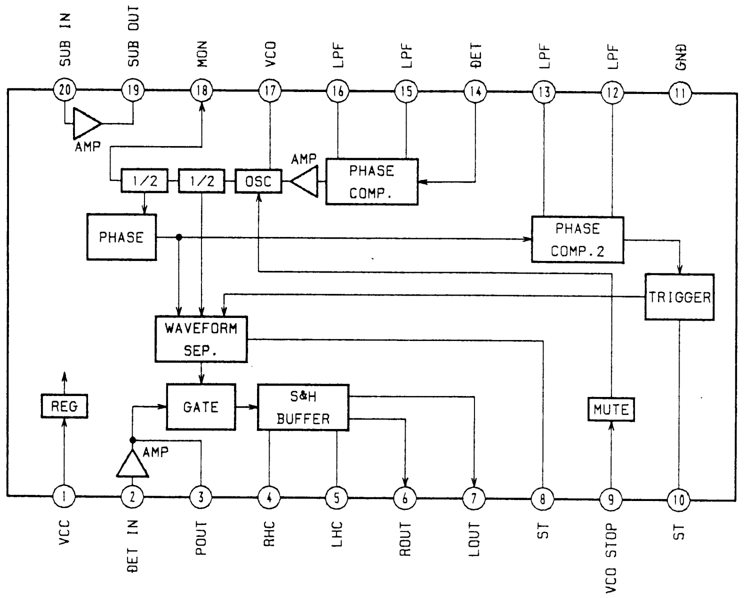
IC302 SAA6579


RDCL
T57
OSCO
OSCI
VDDD
VSSD
TEST
TSTLD
16
15
14
13
12
11
10
9
TEST LOGIC AND OUTPUT SELECTOR SWITCH
QUALITY BIT GENERATOR
OSCILLATOR AND DIVIDER
RECONSTRUCTION FILTER
57KHz BANDPASS (8thORDER)
ANTI-ALIASING FILTER
DIFFERENTIAL DECODER
BIPHASE SYMBOL DECODER
COSTAS LOOP VARIABLE AND FIXED DIVIDER
CLOCKED COMPARATOR
CLOCK REGENERATION AND SYNC
VP1
REFERENCE VOLTAGE
1
2
3
4
5
6
7
8
QUAL
RDDA
Vref
MUX
VDDA
VSSA
CIN
SCOUT

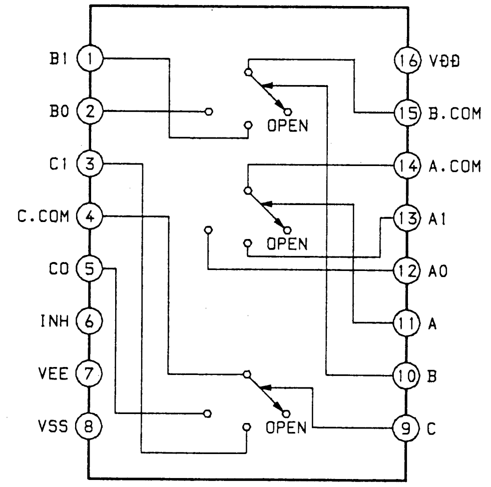
IC601 M66004M6FP


DIG12—DIG15
VCC
SEG00—SEG26
64-61
60
59-33
(35BIT×160)
DECODER
CODE SELECT
DIGIT OUTPUT CIRCUIT
INDICATION CONTROLLER
INDICATION CONTROL RESISTOR
CODE/COMMAND CONTROL CIRCUIT
CODE WRITE
INDICATION CODE RESISTOR (8BIT×16)
SEGMENT OUTPUT CIRCUIT
DECODER
(35BIT×16)
RAM WRITE
SIRIAL RECEIVE CIRCUIT
OUTPUT PORT (2BIT)
CLOCK GENERATER CIRCUIT
1-12
13
14, 15, 16
17, 18
19
20
21
22
23-31
32
DIG11—DIG00
RESET
CS
SCK
SDATA
P1
P0
VCC
X OUT
X IN
VSS
SEG35—SEG27
VG

IC1701 IR3R42


SUB IN
SUB OUT
MON
VCO
LPF
LPF
DET
LPF
LPF
GND
20
19
18
17
16
15
14
13
12
11
AMP
AMP
1/2
1/2
OSC
PHASE COMP.
PHASE
PHASE COMP.2
TRIGGER
WAVEFORM SEP.
REG
GATE
S&H BUFFER
MUTE
AMP
1
2
3
4
5
6
7
8
9
10
VCC
DET IN
POUT
RHC
LHC
ROUT
LOUT
ST
VCO STOP
ST

IC1703 MC14053BCP


B1
B0
C1
C.COM
C0
INH
VEE
VSS
1
2
3
4
5
6
7
8
16
15
14
13
12
11
10
9
VDD
B.COM
A.COM
A1
A0
A
B
C
OPEN
OPEN
OPEN

Note:

- o—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- Δ : internal component.
- ▨ : Pattern from the side which enable seeing.

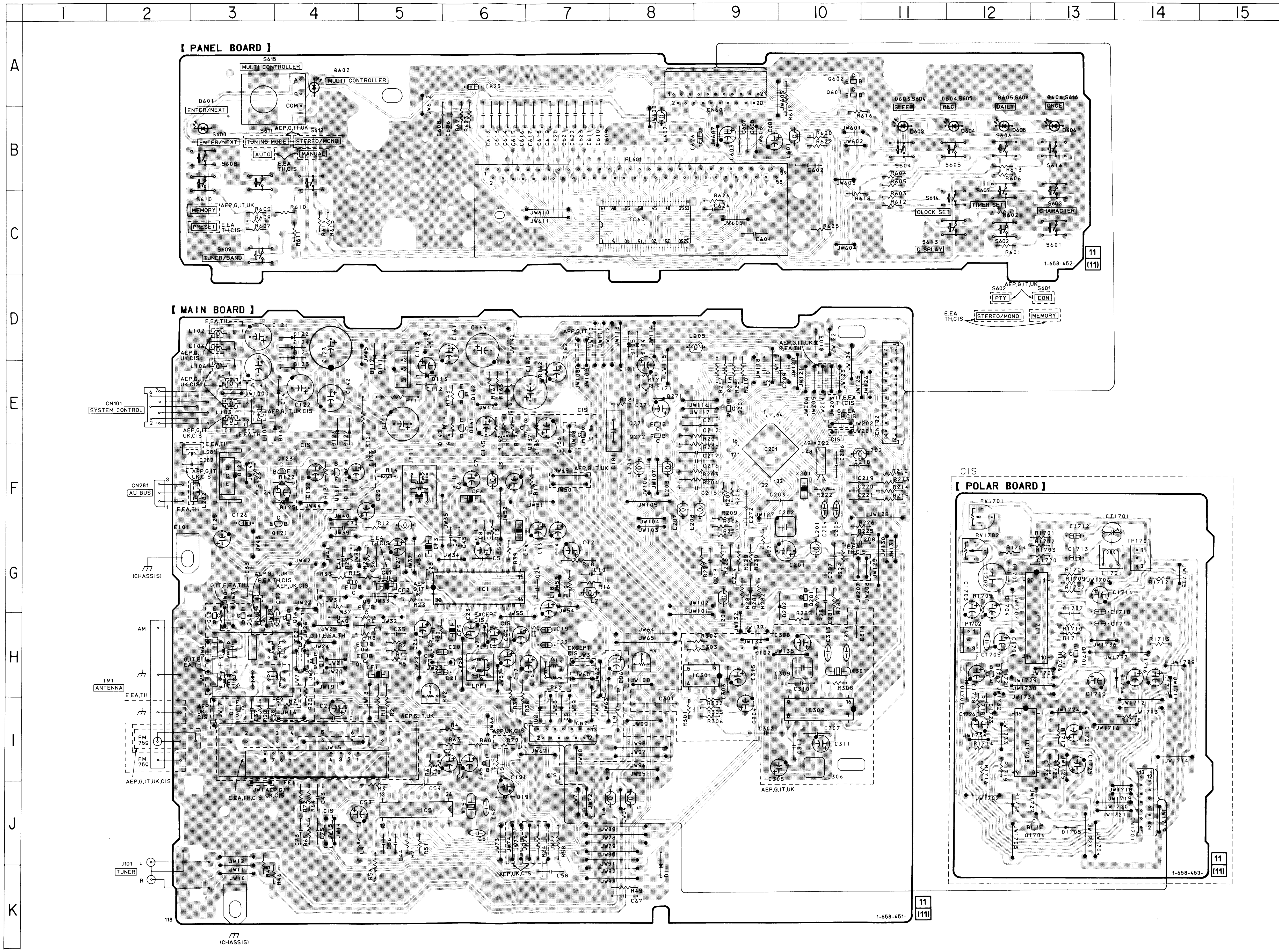
- Abbreviation

G : German model.
IT : Italian model.
EA : Saudi Arabia model.
TH : Thailand model.

5-2. PRINTED WIRING BOARD

- **Semiconductor Location**

Ref. No.	Location	Ref. No.	Location
D1	K-8	IC1	G-6
D2	I-7	IC51	J-5
D3	I-7	IC111	E-5
D102	H-9	IC171	E-8
D103	D-10	IC201	F-9
D104	D-8	IC301	H-9
D105	D-8	IC302	I-10
D111	D-5	IC601	C-8
D112	D-5	IC1701	H-3
D113	E-5	IC1703	I-12
D121	E-4		
D122	D-4	Q1	H-5
D123	E-4	Q2	H-5
D124	D-4	Q9	G-5
D125	F-4	Q10	G-4
D126	E-4	Q11	I-3
D127	E-4	Q12	H-3
D131	F-4	Q13	H-3
D136	E-7	Q14	H-4
D141	E-4	Q15	H-4
D142	E-4	Q55	I-6
D143	E-6	Q121	F-4
D161	E-6	Q122	F-3
D191	J-6	Q123	F-4
D271	E-8	Q131	F-4
D281	G-9	Q136	E-7
D282	G-10	Q137	E-7
D601	B-3	Q141	E-6
D602	A-4	Q142	E-6
D603	B-11	Q201	E-9
D604	B-12	Q271	E-8
D605	B-12	Q272	E-8
D606	B-13	Q281	G-10
D1701	H-12	Q601	A-10
D1703	J-12	Q602	A-10
D1704	H-14	Q1701	H-13
D1705	J-13	Q1702	H-12
		Q1704	J-13


1
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9
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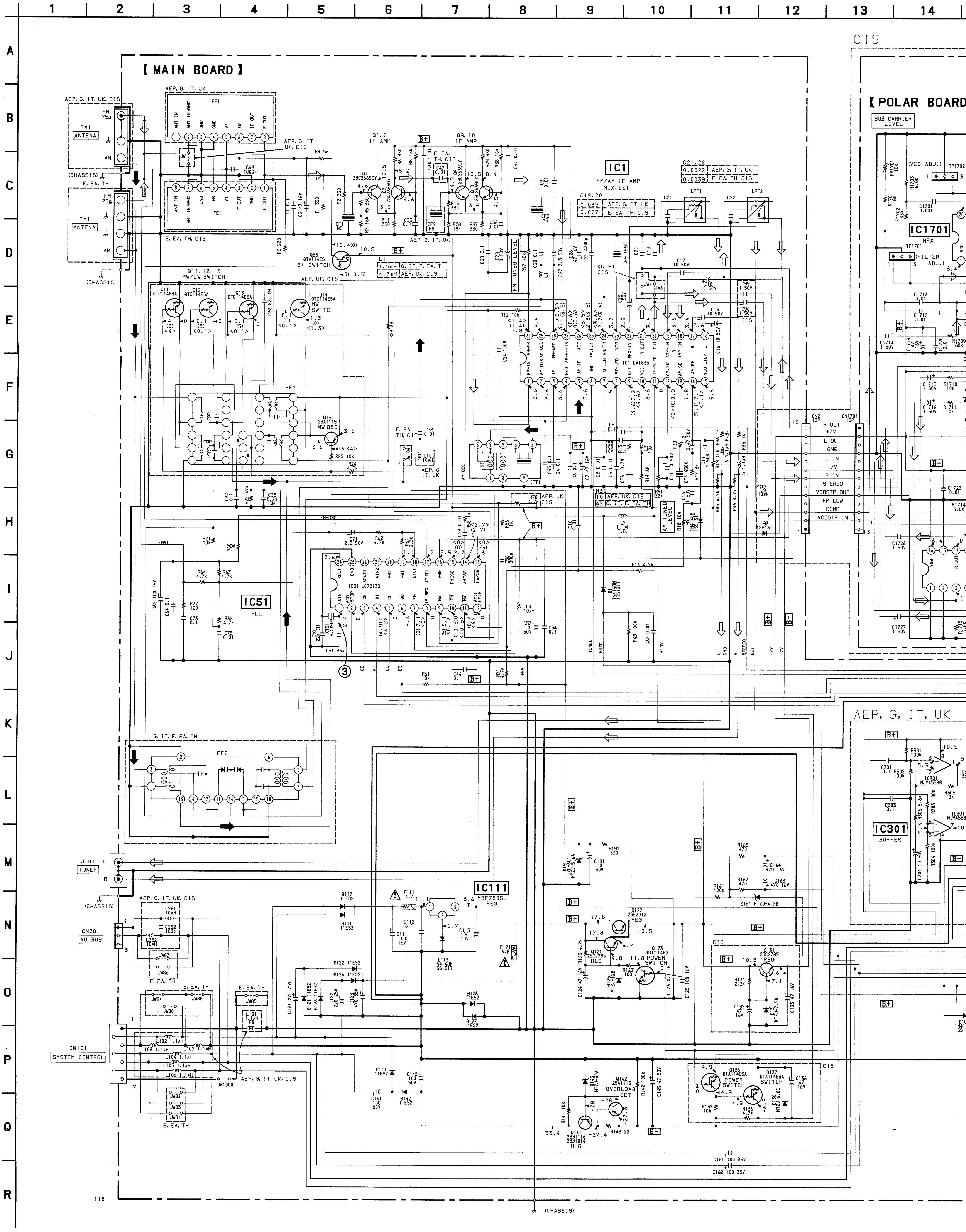
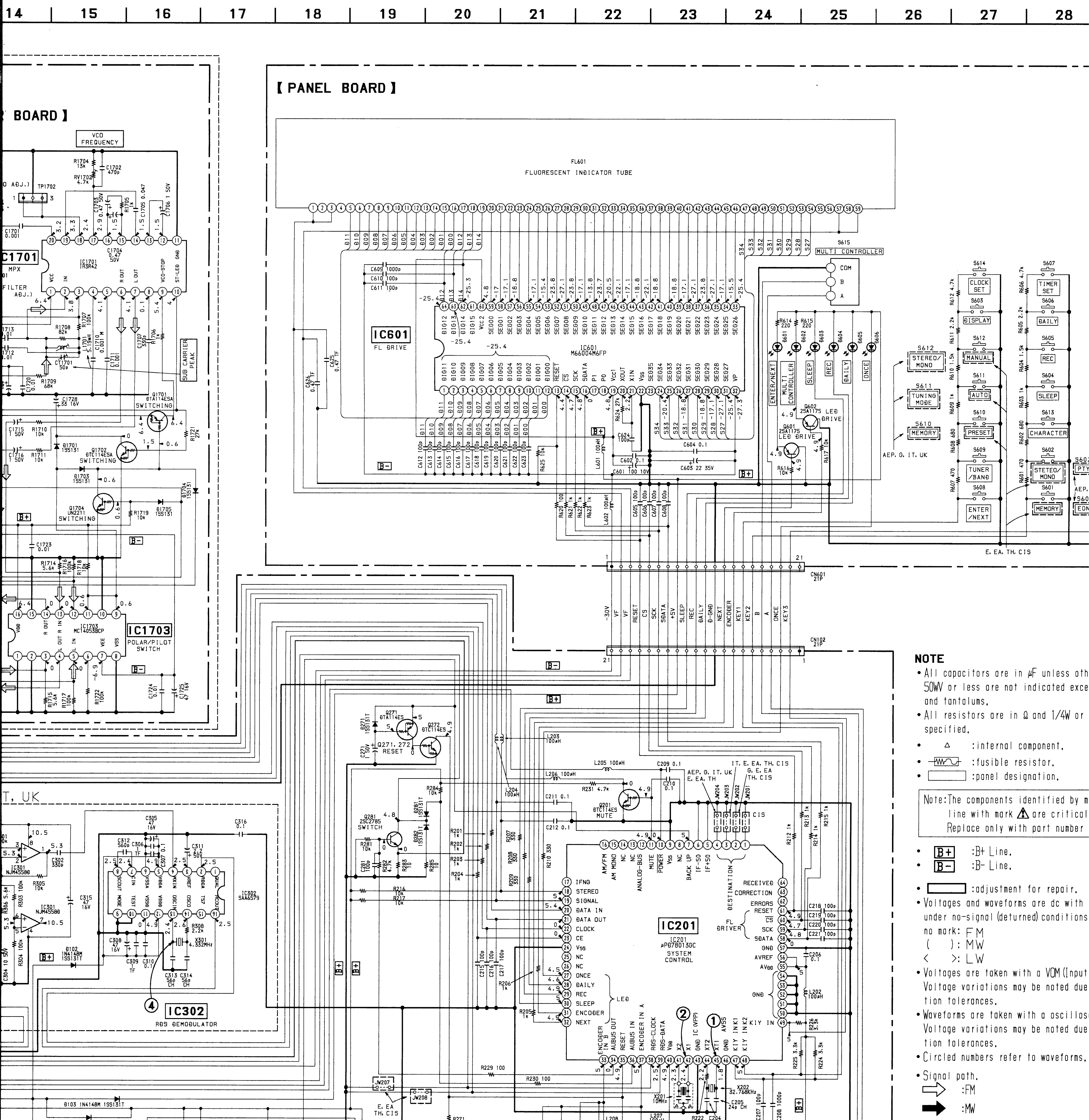
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
K
【 PANEL BOARD 】
MULTI CONTROLLER
ENTER/NEXT
TUNING MODE
STEREO/MONO
AUTO
MANUAL
MEMORY
PRESET
TUNER/BAND
SLEEP
REC
DAILY
ONCE
TIMER SET
CHARACTER
CLOCK SET
DISPLAY
FL601
IC601
1-658-452-
11
(11)
PTY
EON
STEREO/MONO
MEMORY
【 MAIN BOARD 】
CN101
SYSTEM CONTROL
CN281
AU BUS
(CHASSIS)
AM
TM1
ANTENNA
FM 75Ω
J101
TUNER
IC1
IC51
IC201
IC301
IC302
1-658-451-
11
(11)
CIS
【 POLAR BOARD 】
IC1701
IC1703
1-658-453-
11
(11)

5-3. SCHEMATIC DIAGRAM

- See page 8 for IC Block Diagrams.
- See page 17 for IC Pin Function. (IC201)



【MAIN BOARD】
CIS
【POLAR BOARD
AEP, G, IT, UK, CIS
TM1 ANTENNA
FM 75Ω
AM
(CHASSIS)
E, EA, TH
FE1
AEP, G, IT, UK
Q1, 2 IF AMP
Q9, 10 IF AMP
IC1 FM/AM IF AMP MIX, DET
IC1 LA1835
Q55 DTA114ES B+ SWITCH
Q11, 12, 13 MW/LW SWITCH
Q14 DTC114ESA MW SWITCH
FE2
Q15 2SA1115 MW OSC
IC51 PLL
IC51 LC72130
IC111 M5F7805L REG
IC1701 MPX
IC301 BUFFER
SUB CARRIER LEVEL
(VCO ADJ.)
(FILTER ADJ.)
CN2 13P
CN1701 13P
R OUT
+7V
L OUT
GND
L IN
-7V
R IN
STEREO
VCOSTP OUT
FM LOW
COMP
VCOSTP IN
FM TUNED LEVEL
AM TUNED LEVEL
J101 TUNER
CN281 AU BUS
CN101 SYSTEM CONTROL
G, IT, E, EA, TH
Q121 2SC2785 REG
Q122 2SD2012 REG
Q123 DTC114ES POWER SWITCH
Q131 2SC2785 REG
Q136 DTA114ESA POWER SWITCH
Q137 DTA114ESA SWITCH
Q141 2SB1116 2SB1014 REG
Q142 2SA1115 OVERLOAD DET
(CHASSIS)

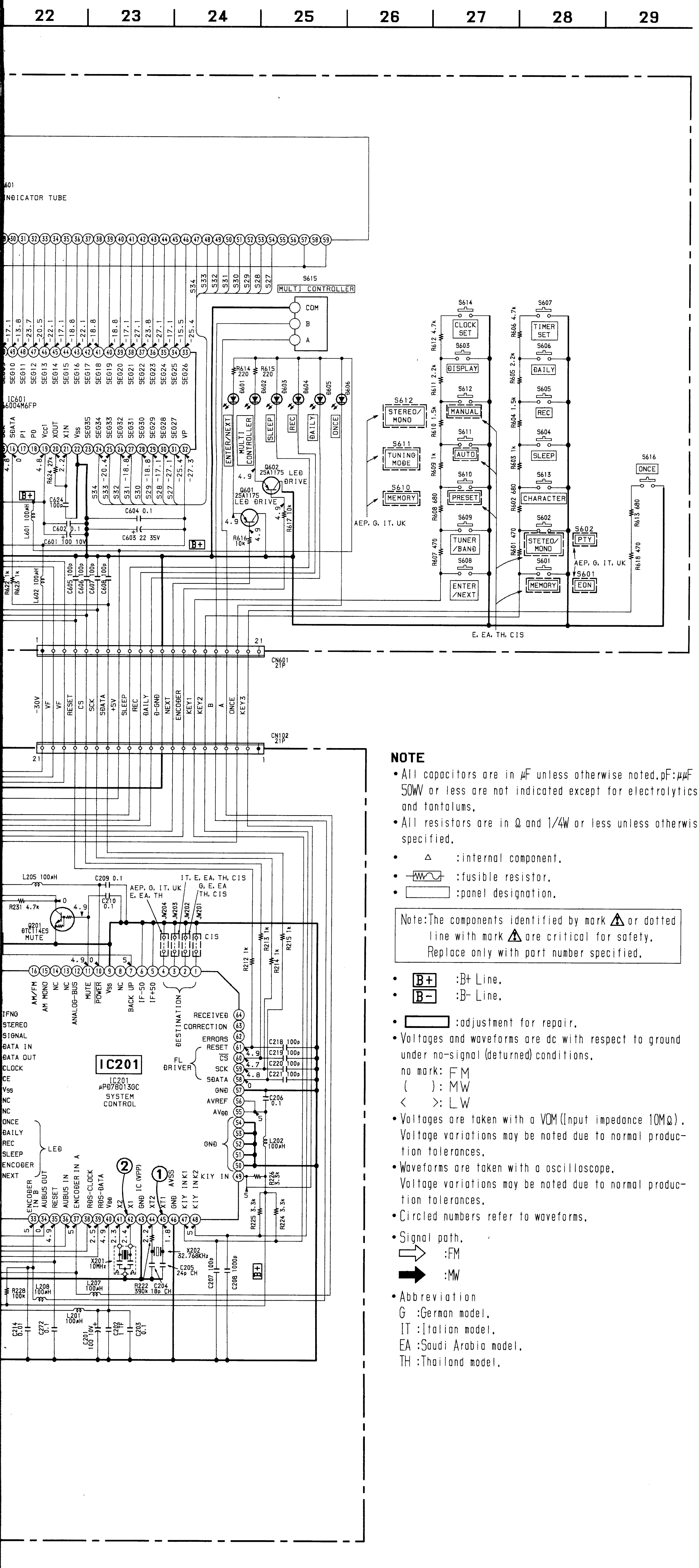

14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
BOARD】
【PANEL BOARD】
VCO FREQUENCY
TP1702
C1701
MPX
IC1701 IR3R42
FILTER ADJ.)
SUB CARRIER PEAK
Q1701 DTA114ESA SWITCHING
Q1701 1SS131
Q1702 DTC114ESA SWITCHING
D1703 1SS131
Q1704 UN2211 SWITCHING
IC1703
IC1703 MC14053BCP
POLAR/PILOT SWITCH
FL601
FLUORESCENT INDICATOR TUBE
IC601
FL DRIVE
IC601 M66004M6FP
S615
MULTI CONTROLLER
COM
B
A
ENTER/NEXT
MULTI CONTROLLER
SLEEP
REC
DAILY
ONCE
Q602 2SA1175 LED DRIVE
Q601 2SA1175 LED DRIVE
S612 STEREO/MONO
S611 TUNING MODE
S610 MEMORY
AEP, G, IT, UK
S614 CLOCK SET
S603 DISPLAY
S612 MANUAL
S611 AUTO
S610 PRESET
S609 TUNER /BAND
S608 ENTER /NEXT
S607 TIMER SET
S606 DAILY
S605 REC
S604 SLEEP
S613 CHARACTER
S602 STEREO/ MONO
S601 MEMORY
E, EA, TH, CIS
CN601 21P
CN102 21P
-30V
VF
VF
RESET
CS
SCK
SDATA
+5V
SLEEP
REC
DAILY
D-GND
NEXT
ENCODER
KEY1
KEY2
B
A
ONCE
KEY3
Q271 DTA114ES
Q272 DTC114ES
Q271, 272 RESET
Q281 2SC2785 SWITCH
Q201 DTC114ES MUTE
AEP, G, IT, UK
E, EA, TH
IT, E, EA, TH, CIS
G, E, EA
TH, CIS
CIS
IC201
IC201 μPD78013OC
SYSTEM CONTROL
IFNG
STEREO
SIGNAL
DATA IN
DATA OUT
CLOCK
CE
Vss
NC
NC
ONCE
DAILY
REC
SLEEP
ENCODER
NEXT
LED
AM/FM
AM MONO
ANALOG-BUS
MUTE
POWER
BACK UP
IF-50
IF+50
DESTINATION
RECEIVED
CORRECTION
ERRORS
RESET
FL DRIVER
SDATA
GND
AVREF
AVDD
ENCODER IN B
AUBUS OUT
RESET
AUBUS IN
ENCODER IN A
RDS-CLOCK
RDS-DATA
VDD
X1
X2
IC (VPP)
XT1
XT2
AVSS
KIY INK1
KIY INK2
KIY IN
X201 10MHz
X202 32.768KHz
JW207
JW208
E, EA TH, CIS
T, UK
IC301 NJM4558D
IC302 SAA6579
X301 4.332MHz
④
①
②
IC302
RDS DEMODULATOR
D103 1N4148M 1SS131T
D104 1N4148M 1SS131T
D105 1N4148M 1SS131T
D102 1N4148M 1SS131T
IC171 PST600C
IC171
RESET

NOTE

- All capacitors are in μF unless oth
  50WV or less are not indicated exce
  and tantalums.
- All resistors are in Ω and 1/4W or
  specified.
- △ :internal component.
- :fusible resistor.
- ☐ :panel designation.

Note:The components identified by m
line with mark ⚠ are critical
Replace only with part number

- B+ :B+ Line.
- B− :B− Line.
- ☐ :adjustment for repair.
- Voltages and waveforms are dc with
  under no-signal (deturned) conditions
  no mark: FM
  ( ): MW
  < >: LW
- Voltages are taken with a VOM (Input
  Voltage variations may be noted due
  tion tolerances.
- Waveforms are taken with a oscillos
  Voltage variations may be noted due
  tion tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ :FM
  ➡ :MW
- Abbreviation
  G :German model.
  IT :Italian model.
  EA :Saudi Arabia model.
  TH :Thailand model.


22
23
24
25
26
27
28
29
INDICATOR TUBE
S615
MULTI CONTROLLER
COM
B
A
IC601
S614
CLOCK SET
S603
DISPLAY
S612
MANUAL
S611
AUTO
S610
PRESET
S609
TUNER /BAND
S608
ENTER /NEXT
S607
TIMER SET
S606
DAILY
S605
REC
S604
SLEEP
S613
CHARACTER
S602
STETEO/ MONO
S601
MEMORY
S602
PTY
S601
EON
S616
ONCE
S612
STEREO/ MONO
S611
TUNING MODE
S610
MEMORY
AEP, G, IT, UK
E, EA, TH, CIS
ENTER/NEXT
MULTI CONTROLLER
SLEEP
REC
DAILY
ONCE
Q602 2SA1175 LED DRIVE
Q601 2SA1175 LED DRIVE
CN601 21P
CN102 21P
-30V
VF
VF
RESET
CS
SCK
SDATA
+5V
SLEEP
REC
DAILY
D-GND
NEXT
ENCODER
KEY1
KEY2
B
A
ONCE
KEY3
Q201 DTC114ES MUTE
IC201
IC201 μPD78013GC SYSTEM CONTROL
RECEIVED
CORRECTION
ERRORS
DESTINATION
FL DRIVER
RESET
CS
SCK
SDATA
GND
AVREF
AVDD
GND
KIY IN
IFNG
STEREO
SIGNAL
DATA IN
DATA OUT
CLOCK
CE
Vss
NC
NC
ONCE
DAILY
REC
SLEEP
ENCODER
NEXT
LED
X201 10MHz
X202 32.768KHz
①
②
IT, E, EA, TH, CIS
AEP, G, IT, UK
G, E, EA
E, EA, TH
TH, CIS
CIS
B+

NOTE

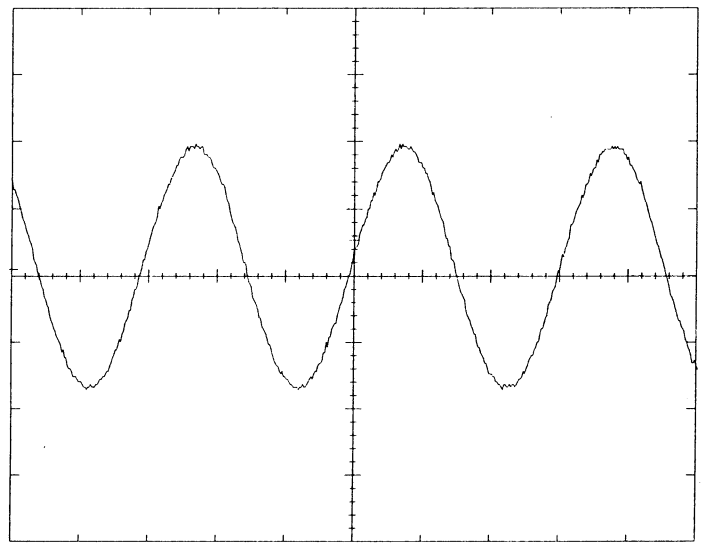
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- △ :internal component.
- :fusible resistor.
- ▭ :panel designation.

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

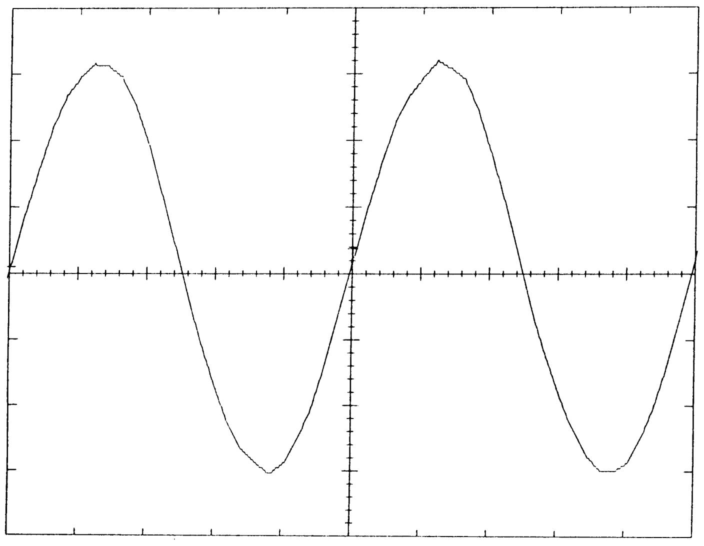
- B+ :B+ Line.
- B- :B- Line.
- ▭ :adjustment for repair.
- Voltages and waveforms are dc with respect to ground under no-signal (deturned) conditions.
  no mark: FM
  ( ): MW
  < >: LW
- Voltages are taken with a VOM (Input impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ :FM
  ➡ :MW
- Abbreviation
  G :German model.
  IT :Italian model.
  EA :Saudi Arabia model.
  TH :Thailand model.

- **Waveforms**

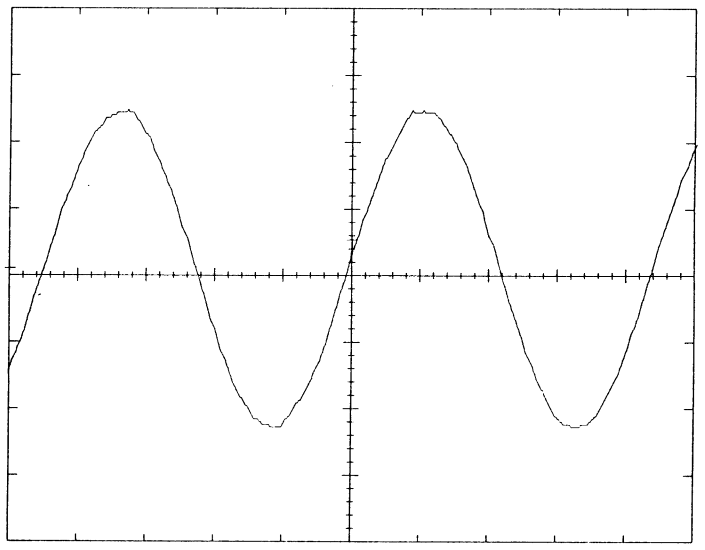
① IC201 ㊺ pin 1.8 Vp-p 32.768 kHz



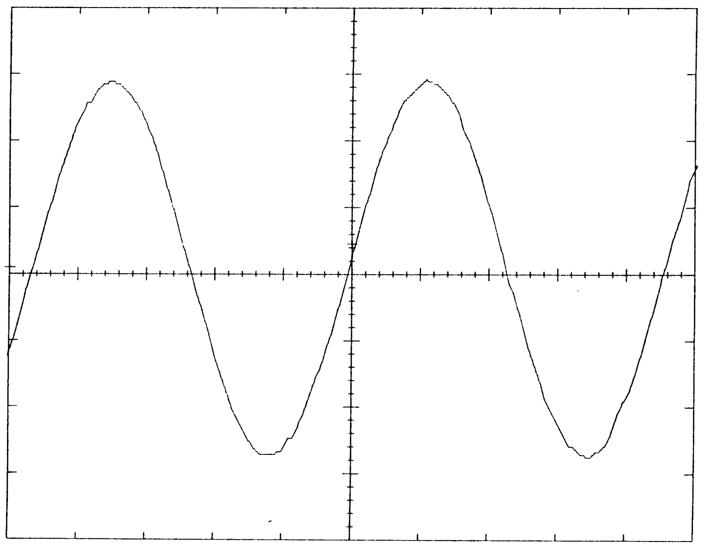
② IC201 ㊷ pin 3.1 Vp-p 10 MHz



③ IC51 ① pin 2.4 Vp-p 4.5 MHz



④ IC302 ⑬ pin 2.8 Vp-p 4.332 MHz

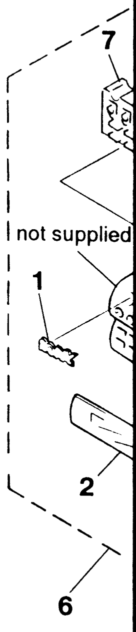


5-4. IC PIN FUNCTION

- **IC201 SYSTEM CONTROL (μPD78013GC)**

Pin No.	Pin Name	I/O	Function
1	DESTINATION	I	Destination selection input.
2	DESTINATION	I	
3	DESTINATION	I	
4	DESTINATION	I	
5	IF +50	I	Not used. (Ground)
6	IF –50	O	
7	BACK UP	I	Back up mode input.
8	NC	–	Not used. (open)
9	Vss	–	Ground
10	$\overline{\text{POWER}}$	O	Power ON/OFF switch control.
11	MUTE	O	Mute output.
12	ANALOG BUS	–	Not used. (open)
13	NC	–	
14	NC	–	
15	AM MONO	–	
16	AM/FM	–	
17	IFNG	–	
18	STEREO	I	STEREO signal input.
19	SIGNAL	I	TUNED signal input.
20	DATA IN	I	Data input. (LC72130, PLL)
21	DATA OUT	O	Data output. (LC72130, PLL)
22	CLOCK	O	Clock output. (LC72130, PLL)
23	CE	O	Chip Enable output. (LC72130, PLL)
24	Vss	–	Ground
25	NC	–	Not used. (open)
26	NC	–	
27	ONCE	O	LED drive output.
28	DAILY	O	
29	REC	O	
30	SLEEP	O	
31	ENCODER	O	
32	NEXT	O	
33	ENCODER IN B	I	ENCODER input. (B)
34	AU BUS OUT	O	Audio bus output.
35	RESET	I	SYSTEM RESET input.
36	AU BUS IN	I	Audio bus input.
37	ENCODER IN A	I	ENCODER input. (A)
38	RDS-CLOCK	I	RDS clock input.
39	RDS-DATA	I	RDS data input.
40	VDD	–	Power supply 5V.
41	X2	O	System main clock. (10 MHz)
42	X1	I	
43	GND	–	Ground
44	XT2	O	System sub clock. (32.768 kHz)
45	XT1	I	
46	GND	–	Ground
47	KEY IN K1	I	Key input. (analog)
48	KEY IN K2	I	
49	KEY IN	I	
50	GND	–	Ground
51	GND	–	
52	GND	–	
53	GND	–	
54	GND	–	
55	AVDD	–	Analog power supply +5V.
56	AVREF	–	Analog system reference voltage input.
57	GND	–	Ground
58	SDATA	O	Fluorescent tube data output. (IC601)
59	SCK	O	Fluorescent tube clock output. (IC601)
60	$\overline{\text{CS}}$	O	Fluorescent tube chip select signal output. (IC601)
61	RESET	O	Fluorescent tube reset signal output. (IC601)
62	ERRORS	I	Note used. (open)
63	CORRECTION	O	
64	RECEIVED	O	

NOTE:
- Items mark
seldom req
should be a
- Color Indic
KNOB, BA

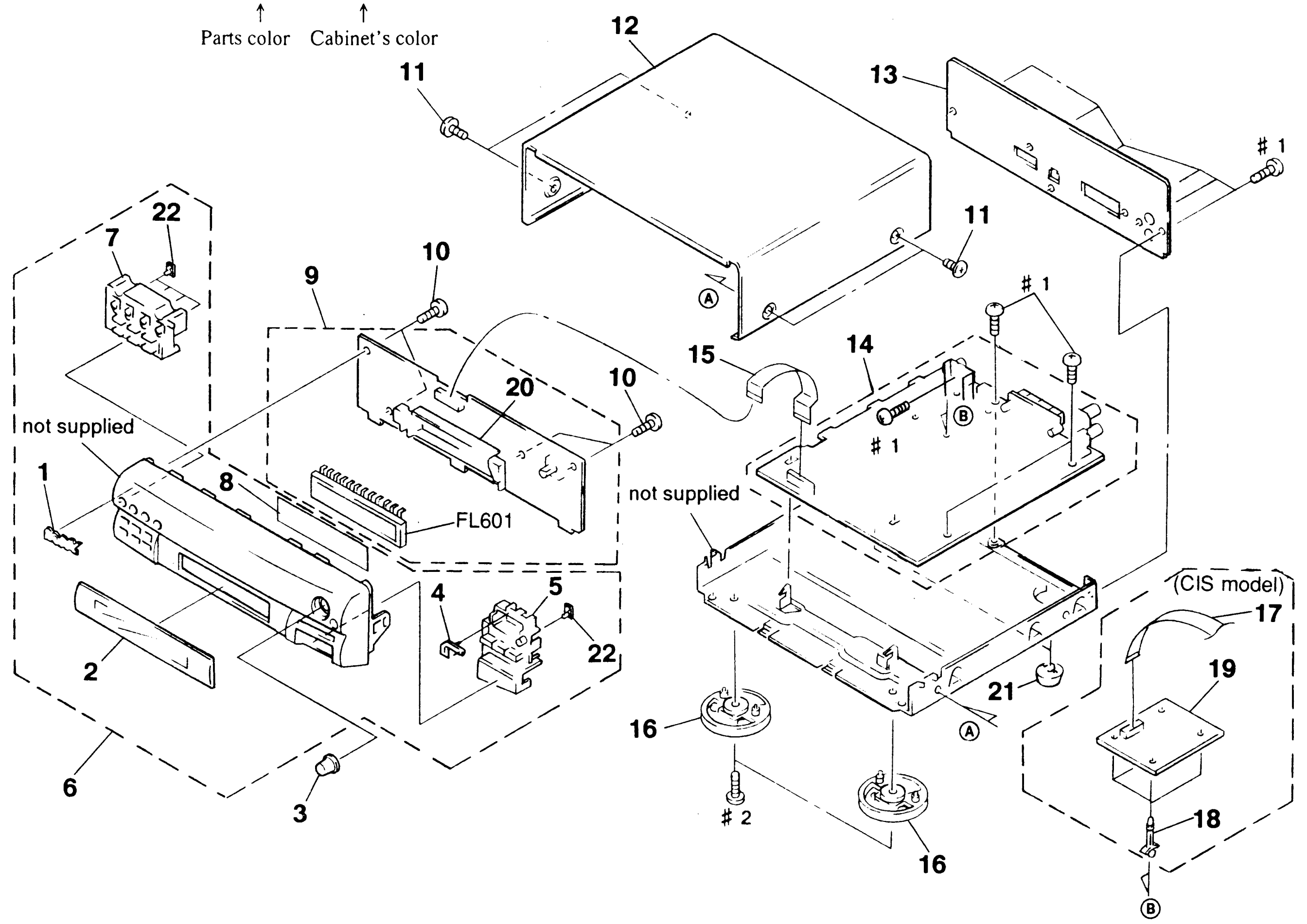


Ref. No.	Par
1	4-9
2	X-4
2	X-4
3	4-9
3	4-9
4	4-9
5	4-9
5	4-9
5	4-9
6	X-4
6	X-4
6	X-4
6	X-4
7	4-9
7	4-9
8	4-9
* 9	A-4
* 9	A-4
10	4-9

SECTION 6
EXPLODED VIEW

NOTE:

- Items marked " ✱ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Color Indication of Appearance Parts Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts color Cabinet's color
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  TH : Thailand model



Ref. No.	Part No.	Description	Remark
1	4-962-708-11	EMBLEM (4-A), SONY	
2	X-4946-909-1	WINDOW (FL) ASSY (for SILVER)	
2	X-4946-912-1	WINDOW (FL) ASSY (for BLACK)	
3	4-977-680-11	KNOB (JOG) (GRAY)... (SILVER)	
3	4-977-680-21	KNOB (JOG) (BLACK)... (BLACK)	
4	4-977-705-11	INDICATOR (JOG)	
5	4-977-704-11	BUTTON (BAND) (GRAY)... (SILVER)	(AEP, UK, G, IT)
5	4-977-704-21	BUTTON (BAND) (GRAY)... (SILVER)	(E, CIS, EA, TH)
5	4-977-704-31	BUTTON (BAND) (BLACK)... (BLACK)	(AEP, UK, G, IT)
6	X-4946-594-1	PANEL ASSY (S), FRONT (SILVER) (E, EA)	
6	X-4946-834-1	PANEL ASSY (BP), FRONT (BLACK)	(AEP, UK, G, IT)
6	X-4946-956-1	PANEL ASSY (SP), FRONT (SILVER) (CIS, TH)	
6	X-4946-965-1	PANEL ASSY (SP), FRONT (SILVER)	(AEP, UK, G, IT)
7	4-977-703-11	BUTTON (TIMER) (GRAY)... (SILVER)	(AEP, UK, G, E, CIS, EA, TH)
7	4-977-703-21	BUTTON (TIMER) (BLACK)... (BLACK)	(AEP, UK, G, IT)
8	4-979-353-11	FILTER (MD)	
✱ 9	A-4378-851-A	PANEL BOARD, COMPLETE (E, EA, TH)	
✱ 9	A-4378-864-A	PANEL BOARD, COMPLETE (AEP, UK, G, IT, CIS)	
10	4-951-620-01	SCREW (2.6X8), +BVTP	

Ref. No.	Part No.	Description	Remark
11	3-363-099-01	SCREW (CASE 3 TP2)	
✱ 12	4-970-927-21	CASE (BLACK)	
✱ 12	4-970-927-41	CASE (SILVER)	
✱ 13	4-978-999-01	PANEL, BACK (E)	
✱ 13	4-978-999-11	PANEL, BACK (Made in France)	(AEP, UK, G, IT, CIS)
✱ 13	4-978-999-21	PANEL, BACK (Made in Malaysia) (AEP, UK)	
✱ 13	4-978-999-31	PANEL, BACK (EA)	
✱ 13	4-978-999-41	PANEL, BACK (TH)	
✱ 14	A-4378-850-A	MAIN BOARD, COMPLETE (E, EA, TH)	
✱ 14	A-4378-863-A	MAIN BOARD, COMPLETE (AEP, UK)	
✱ 14	A-4378-865-A	MAIN BOARD, COMPLETE (G)	
✱ 14	A-4389-478-A	MAIN BOARD, COMPLETE (IT)	
✱ 14	A-4389-479-A	MAIN BOARD, COMPLETE (CIS)	
15	1-773-144-11	WIRE (FLAT TYPE) (21 CORE)	
16	4-977-699-11	LEG (F)	
17	1-751-688-11	WIRE (FLAT TYPE) (13 CORE) (CIS)	
18	4-924-098-91	HOLDER, PC BOARD (CIS)	
✱ 19	A-4389-480-A	POLAR BOARD, COMPLETE (CIS)	
✱ 20	4-979-798-01	HOLDER (FL)	
21	4-965-822-01	FOOT	
22	4-977-674-11	INDICATOR (ENTER)	
FL601	1-517-368-11	INDICATOR TUBE, FLUORESCENT	

MAIN

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "✱" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA..., uPB...: μPB...,
  uPC...: μPC..., uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH
- Abbreviation
  G : German model
  IT : Italian model
  EA : Saudi Arabia model
  TH : Thailand model

Ref. No.	Part No.	Description	Remark
✱	A-4378-863-A	MAIN BOARD, COMPLETE (AEP, UK) ✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱	
✱	A-4378-850-A	MAIN BOARD, COMPLETE (E, EA, TH) ✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱	
✱	A-4378-865-A	MAIN BOARD, COMPLETE (G) ✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱	
✱	A-4389-478-A	MAIN BORAD, COMPLETE (IT) ✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱	
✱	A-4389-479-A	MAIN BOARD, COMPLETE (CIS) ✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱✱	
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
		< CAPACITOR >	
C1	1-164-159-21	CERAMIC 0.1uF 50V	
C2	1-126-967-11	ELECT 47uF 20% 16V	
C3	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C4	1-164-159-21	CERAMIC 0.1uF 50V	
C5	1-164-159-21	CERAMIC 0.1uF 50V	
C6	1-164-159-21	CERAMIC 0.1uF 50V	
C7	1-126-967-11	ELECT 47uF 20% 16V	
C8	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C9	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C10	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C11	1-126-964-11	ELECT 10uF 20% 50V	
C12	1-124-902-00	ELECT 0.47uF 20% 50V	
C13	1-124-903-11	ELECT 1uF 20% 50V	
C14	1-124-903-11	ELECT 1uF 20% 50V	
C15	1-126-964-11	ELECT 10uF 20% 50V	
C16	1-126-964-11	ELECT 10uF 20% 50V	
C17	1-126-964-11	ELECT 10uF 20% 50V	
C18	1-126-964-11	ELECT 10uF 20% 50V	
C19	1-136-160-00	FILM 0.039uF 5% 50V	(AEP, G, IT, UK)
C19	1-136-158-00	FILM 0.027uF 5% 50V	(E, EA, TH, CIS)
C20	1-136-160-00	FILM 0.039uF 5% 50V	(AEP, G, IT, UK)
C20	1-136-158-00	FILM 0.027uF 5% 50V	(E, EA, TH, CIS)
C21	1-137-389-11	FILM 0.0022uF 5% 100V	(AEP, G, IT, UK)

Ref. No.	Part No.	Description	Remark
C21	1-137-436-11	FILM 0.0039uF 5% 50V	(E, EA, TH, CIS)
C22	1-137-389-11	FILM 0.0022uF 5% 100V	(AEP, G, IT, UK)
C22	1-137-436-11	FILM 0.0039uF 5% 50V	(E, EA, TH, CIS)
C23	1-124-903-11	ELECT 1uF 20% 50V	
C24	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C25	1-162-600-11	CERAMIC 0.0047uF 30% 16V	
C26	1-126-967-11	ELECT 47uF 20% 16V	
C27	1-126-962-11	ELECT 3.3uF 20% 50V	
C28	1-164-159-21	CERAMIC 0.1uF 50V	
C29	1-126-964-11	ELECT 10uF 20% 50V	
C30	1-164-159-21	CERAMIC 0.1uF 50V	
C32	1-102-527-11	CERAMIC 82PF 5% 50V	(AEP, UK, CIS)
C33	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C35	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C36	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C37	1-164-159-21	CERAMIC 0.1uF 50V	
C38	1-162-198-31	CERAMIC 8.2PF 10% 50V	
C40	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C41	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C43	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C44	1-164-159-21	CERAMIC 0.1uF 50V	
C45	1-164-159-21	CERAMIC 0.1uF 50V	
C47	1-102-129-00	CERAMIC 0.01uF 10% 50V	(E, EA, TH, CIS)
C51	1-102-518-11	CERAMIC 33PF 5% 50V	
C52	1-102-959-00	CERAMIC 22PF 5% 50V	
C53	1-126-964-11	ELECT 10uF 20% 50V	
C54	1-164-159-21	CERAMIC 0.1uF 50V	
C55	1-126-933-11	ELECT 100uF 20% 10V	
C56	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C58	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C64	1-164-159-21	CERAMIC 0.1uF 50V	
C65	1-126-933-11	ELECT 100uF 20% 16V	
C67	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C71	1-124-925-11	ELECT 2.2uF 20% 100V	
C73	1-164-159-21	CERAMIC 0.1uF 50V	
C75	1-162-306-11	CERAMIC 0.01uF 30% 16V	
C95	1-124-903-11	ELECT 1uF 20% 50V	(CIS)

Ref. No.	Part No.	Description			Remark
C96	1-124-903-11	ELECT	1uF	20%	50V (CIS)
C111	1-126-952-11	ELECT	1000uF	20%	16V
C112	1-164-159-21	CERAMIC	0.1uF		50V
C113	1-126-933-11	ELECT	100uF	20%	10V
C121	1-104-666-11	ELECT	220uF	20%	25V
C122	1-104-666-11	ELECT	220uF	20%	25V
C123	1-126-951-11	ELECT	470uF	20%	35V
C124	1-126-967-11	ELECT	47uF	20%	16V
C125	1-126-933-11	ELECT	100uF	20%	16V
C126	1-136-165-00	FILM	0.1uF	5%	50V
C132	1-126-967-11	ELECT	47uF	20%	16V (CIS)
C133	1-126-967-11	ELECT	47uF	20%	16V (CIS)
C136	1-126-967-11	ELECT	47uF	20%	16V (CIS)
C141	1-126-968-11	ELECT	100uF	20%	50V
C142	1-126-968-11	ELECT	100uF	20%	50V
C145	1-126-967-11	ELECT	47uF	20%	50V
C161	1-126-948-11	ELECT	100uF	20%	35V
C162	1-126-948-11	ELECT	100uF	20%	35V
C163	1-126-935-11	ELECT	470uF	20%	16V
C164	1-126-935-11	ELECT	470uF	20%	16V
C171	1-126-964-11	ELECT	10uF	20%	50V
C181	1-125-705-11	CAPACITOR	0.22F	0	5.5V
C191	1-126-964-11	ELECT	10uF	20%	50V
C201	1-126-933-11	ELECT	100uF	20%	10V
C202	1-136-177-00	FILM	1uF	5%	50V
C203	1-164-159-21	CERAMIC	0.1uF		50V
C204	1-102-953-00	CERAMIC	18PF	5%	50V
C205	1-102-960-00	CERAMIC	24PF	5%	50V
C206	1-164-159-21	CERAMIC	0.1uF		50V
C207	1-162-282-31	CERAMIC	100PF	10%	50V
C208	1-162-294-31	CERAMIC	0.001uF	10%	50V
C209	1-164-159-21	CERAMIC	0.1uF		50V
C210	1-164-159-21	CERAMIC	0.1uF		50V
C211	1-164-159-21	CERAMIC	0.1uF		50V
C212	1-164-159-21	CERAMIC	0.1uF		50V
C213	1-162-306-11	CERAMIC	0.01uF	30%	16V
C214	1-162-306-11	CERAMIC	0.01uF	30%	16V
C215	1-162-282-31	CERAMIC	100PF	10%	50V
C216	1-162-282-31	CERAMIC	100PF	10%	50V
C217	1-162-282-31	CERAMIC	100PF	10%	50V
C218	1-162-282-31	CERAMIC	100PF	10%	50V
C219	1-162-282-31	CERAMIC	100PF	10%	50V
C220	1-162-282-31	CERAMIC	100PF	10%	50V
C221	1-162-282-31	CERAMIC	100PF	10%	50V
C271	1-124-903-11	ELECT	1uF	20%	50V
C272	1-164-159-21	CERAMIC	0.1uF		50V
C281	1-162-282-31	CERAMIC	100PF	10%	50V
C282	1-162-282-31	CERAMIC	100PF	10%	50V (AEP, G, IT, UK, CIS)
C301	1-164-159-21	CERAMIC	0.1uF		50V (AEP, G, IT, UK)
C302	1-162-288-31	CERAMIC	330PF	10%	50V (AEP, G, IT, UK)
C303	1-164-159-21	CERAMIC	0.1uF		50V (AEP, G, IT, UK)
C304	1-126-964-11	ELECT	10uF	20%	50V (AEP, G, IT, UK)
C305	1-126-967-11	ELECT	47uF	20%	16V (AEP, G, IT, UK)
C306	1-136-177-00	FILM	1uF	5%	50V (AEP, G, IT, UK)
C307	1-164-159-21	CERAMIC	0.1uF		50V (AEP, G, IT, UK)
C308	1-126-967-11	ELECT	47uF	20%	16V (AEP, G, IT, UK)
C309	1-136-177-00	FILM	1uF	5%	50V (AEP, G, IT, UK)
C310	1-164-159-21	CERAMIC	0.1uF		50V (AEP, G, IT, UK)
C311	1-124-925-11	ELECT	2.2uF	20%	100V (AEP, G, IT, UK)
C312	1-162-291-31	CERAMIC	560PF	10%	50V (AEP, G, IT, UK)
C313	1-101-884-00	CERAMIC	56PF	5%	50V (AEP, G, IT, UK)
C314	1-101-884-00	CERAMIC	56PF	5%	50V (AEP, G, IT, UK)
C315	1-126-967-11	ELECT	47uF	20%	16V (AEP, G, IT, UK)
C316	1-164-159-21	CERAMIC	0.1uF		50V (AEP, G, IT, UK)
		< FILTER >			
CF1	1-579-374-71	FILTER, CERAMIC (AEP, G, IT, UK)			
CF1	1-567-389-11	FILTER, CERAMIC (E, EA, TH, CIS)			
CF2	1-760-393-11	FILTER, CERAMIC (AEP, G, IT, UK)			
CF3	1-760-393-11	FILTER, CERAMIC (AEP, G, IT, UK)			
CF3	1-567-389-11	FILTER, CERAMIC (E, EA, TH, CIS)			
CF4	1-527-981-00	FILTER, CERAMIC			
CF5	1-577-075-11	OSCILLATOR, CERAMIC			
CF6	1-760-220-11	FILTER, CERAMIC			
		< CONNECTOR >			
* CN2	1-568-832-11	SOCKET, CONNECTOR 13P (CIS)			
CN101	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)			
CN102	1-568-838-11	SOCKET, CONNECTOR 21P			
* CN281	1-565-561-11	PIN, CONNECTOR 3P (AU BUS)			
		< DIODE >			
D1	8-719-815-85	DIODE	1S1585		
D2	8-719-815-85	DIODE	1S1585		
D3	8-719-815-85	DIODE	1S1585 (CIS)		
D102	8-719-815-85	DIODE	1S1585 (AEP, G, IT, UK)		
D103	8-719-815-85	DIODE	1S1585		

MAIN

Ref. No.	Part No.	Description	Remark
D104	8-719-815-85	DIODE 1S1585	
D105	8-719-815-85	DIODE 1S1585	
D111	8-719-200-82	DIODE 11ES2	
D112	8-719-200-82	DIODE 11ES2	
D113	8-719-815-85	DIODE 1S1585	
D121	8-719-200-82	DIODE 11ES2	
D122	8-719-200-82	DIODE 11ES2	
D123	8-719-200-82	DIODE 11ES2	
D124	8-719-200-82	DIODE 11ES2	
D125	8-719-110-31	DIODE RD12ES-B2	
D126	8-719-200-82	DIODE 11ES2	
D127	8-719-200-82	DIODE 11ES2	
D131	8-719-921-63	DIODE MTZJ-7.5B (CIS)	
D136	8-719-109-97	DIODE RD6.8ES-B2 (CIS)	
D141	8-719-200-82	DIODE 11ES2	
D142	8-719-200-82	DIODE 11ES2	
D143	8-719-982-19	DIODE MTZJ-30A	
D161	8-719-010-34	DIODE UZ-4.7BSC	
D191	8-719-109-88	DIODE RD5.6ES-B1	
D271	8-719-815-85	DIODE 1S1585	
D281	8-719-815-85	DIODE 1S1585	
D282	8-719-815-85	DIODE 1S1585	

< FRONTEND >

Ref. No.	Part No.	Description	Remark
FE1	1-693-253-21	FRONT END (4 GANG) (AEP, G, IT, UK)	
FE1	1-693-090-51	FRONT END (FM) (2 GANG) (E, EA, TH)	
FE1	1-693-244-21	FRONT END (3 GANG) (CIS)	
FE2	1-233-514-11	ENCAPSULATED COMPONENT (AEP, UK, CIS)	
FE2	1-239-634-11	ENCAPSULATED COMPONENT, AM. RF	(G, IT, E, EA, TH)

< IC >

Ref. No.	Part No.	Description	Remark
IC1	8-759-176-03	IC LA1835	
IC51	8-759-288-54	IC LC72130	
IC111	8-759-231-53	IC TA7805S	
IC171	8-759-165-80	IC PST600C-T	
IC201	8-759-338-81	IC uPD78013GC-652-AB8	
IC301	8-759-634-51	IC M5218AP (AEP, G, IT, UK)	
IC302	8-759-169-99	IC SAA6579 (AEP, G, IT, UK)	

< IFT >

Ref. No.	Part No.	Description	Remark
IFT1	1-409-636-11	TRANSFORMER, IF(CERAMIC FILTER)	

< JACK >

Ref. No.	Part No.	Description	Remark
J101	1-770-272-11	JACK, PIN 2P (TUNER)	

< COIL >

Ref. No.	Part No.	Description	Remark
L1	1-407-500-00	INDUCTOR 4.7mH (AEP, UK, CIS)	
L1	1-410-688-31	INDUCTOR 1.5mH (G, IT, E, EA, TH)	
L3	1-414-183-41	INDUCTOR 10uH	
L4	1-410-509-11	INDUCTOR 10uH	
L5	1-410-397-21	FERRITE BEAD INDUCTOR	
L6	1-410-397-21	FERRITE BEAD INDUCTOR	
L7	1-410-397-21	FERRITE BEAD INDUCTOR	
L9	1-410-509-11	INDUCTOR 10uH (CIS)	
L10	1-414-183-41	INDUCTOR 10uH (AEP, G, IT, UK)	
L101	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
L102	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
L103	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
L104	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
L105	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
L106	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
L107	1-410-397-21	FERRITE BEAD INDUCTOR (AEP, G, IT, UK, CIS)	
L201	1-414-189-31	INDUCTOR 100uH	
L202	1-414-189-31	INDUCTOR 100uH	
L203	1-410-521-11	INDUCTOR 100uH	
L204	1-410-521-11	INDUCTOR 100uH	
L205	1-410-521-11	INDUCTOR 100uH	
L206	1-410-521-11	INDUCTOR 100uH	
L207	1-410-521-11	INDUCTOR 100uH	
L208	1-410-521-11	INDUCTOR 100uH	
L281	1-410-509-11	INDUCTOR 10uH (AEP, G, IT, UK, CIS)	
L282	1-410-509-11	INDUCTOR 10uH (AEP, G, IT, UK, CIS)	

< FILTER >

Ref. No.	Part No.	Description	Remark
LPF1	1-239-597-11	FILTER, LOW PASS	
LPF2	1-239-597-11	FILTER, LOW PASS	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q1	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q2	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q9	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q10	8-729-230-99	TRANSISTOR 2SC2669-OY	
Q11	8-729-029-67	TRANSISTOR DTC114ESA-TP (AEP, UK, CIS)	
Q12	8-729-029-67	TRANSISTOR DTC114ESA-TP (AEP, UK, CIS)	
Q13	8-729-029-67	TRANSISTOR DTC114ESA-TP (AEP, UK, CIS)	
Q14	8-729-029-67	TRANSISTOR DTC114ESA-TP (AEP, UK, CIS)	
Q15	8-729-119-76	TRANSISTOR 2SA1175-HFE (AEP, UK, CIS)	
Q55	8-729-029-21	TRANSISTOR DTA114ESA-TP	
Q121	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q122	8-729-209-15	TRANSISTOR 2SD2012	
Q123	8-729-029-67	TRANSISTOR DTC114ESA-TP	
Q131	8-729-119-78	TRANSISTOR 2SC2785-HFE (CIS)	
Q136	8-729-029-21	TRANSISTOR DTA114ESA-TP (CIS)	
Q137	8-729-029-21	TRANSISTOR DTA114ESA-TP (CIS)	
Q141	8-729-118-00	TRANSISTOR 2SB1116-L	
Q142	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q201	8-729-029-67	TRANSISTOR DTC114ESA-TP	
Q271	8-729-029-21	TRANSISTOR DTA114ESA-TP	

Ref. No.	Part No.	Description				Remark
Q272	8-729-029-67	TRANSISTOR	DTC114ESA-TP			
Q281	8-729-119-78	TRANSISTOR	2SC2785-HFE			
		< RESISTOR >				
R1	1-249-411-11	CARBON	330	5%	1/4W	
R2	1-249-411-11	CARBON	330	5%	1/4W	
R3	1-247-815-91	CARBON	220	5%	1/4W	
R4	1-249-402-11	CARBON	56	5%	1/4W	
R5	1-249-411-11	CARBON	330	5%	1/4W	
R6	1-249-411-11	CARBON	330	5%	1/4W	
R7	1-249-432-11	CARBON	18K	5%	1/4W	
R8	1-249-432-11	CARBON	18K	5%	1/4W	
R11	1-249-411-11	CARBON	330	5%	1/4W	
R12	1-249-429-11	CARBON	10K	5%	1/4W	
R13	1-249-442-11	CARBON	510	5%	1/4W	
R14	1-249-403-11	CARBON	68	5%	1/4W	
R15	1-249-411-11	CARBON	330	5%	1/4W	
R16	1-249-425-11	CARBON	4.7K	5%	1/4W	
R17	1-247-842-11	CARBON	3K	5%	1/4W	
R18	1-249-429-11	CARBON	10K	5%	1/4W	
R19	1-249-429-11	CARBON	10K	5%	1/4W	
R21	1-249-429-11	CARBON	10K	5%	1/4W	
R22	1-249-437-11	CARBON	47K	5%	1/4W	
R23	1-249-399-11	CARBON	33	5%	1/4W	
R24	1-249-425-11	CARBON	4.7K	5%	1/4W	(AEP, UK, CIS)
R25	1-249-429-11	CARBON	10K	5%	1/4W	(AEP, UK, CIS)
R28	1-249-432-11	CARBON	18K	5%	1/4W	
R29	1-249-411-11	CARBON	330	5%	1/4W	
R35	1-249-417-11	CARBON	1K	5%	1/4W	
R36	1-249-417-11	CARBON	1K	5%	1/4W	
R37	1-249-411-11	CARBON	330	5%	1/4W	
R38	1-249-432-11	CARBON	18K	5%	1/4W	
R39	1-249-393-11	CARBON	10	5%	1/4W	(AEP, UK, CIS)
R39	1-249-401-11	CARBON	47	5%	1/4W	(G, IT, E, EA, TH)
R45	1-249-425-11	CARBON	4.7K	5%	1/4W	
R46	1-249-425-11	CARBON	4.7K	5%	1/4W	
R49	1-249-441-11	CARBON	100K	5%	1/4W	
R51	1-249-429-11	CARBON	10K	5%	1/4W	
R56	1-249-417-11	CARBON	1K	5%	1/4W	
R58	1-249-417-11	CARBON	1K	5%	1/4W	
R60	1-249-405-11	CARBON	100	5%	1/4W	
R61	1-249-423-11	CARBON	3.3K	5%	1/4W	
R62	1-249-425-11	CARBON	4.7K	5%	1/4W	
R63	1-249-425-11	CARBON	4.7K	5%	1/4W	
R64	1-249-425-11	CARBON	4.7K	5%	1/4W	
R65	1-249-425-11	CARBON	4.7K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R70	1-249-425-11	CARBON	4.7K	5%	1/4W	(AEP, UK, CIS)
R71	1-249-425-11	CARBON	4.7K	5%	1/4W	
R72	1-247-807-31	CARBON	100	5%	1/4W	
⚠R111	1-217-641-00	FUSIBLE	4.7	5%	1/4W	F
⚠R121	1-217-642-81	FUSIBLE	6.8	5%	1/4W	F
R122	1-247-807-31	CARBON	100	5%	1/4W	
R123	1-249-425-11	CARBON	4.7K	5%	1/4W	
R131	1-249-421-11	CARBON	2.2K	5%	1/4W	(CIS)
R136	1-249-425-11	CARBON	4.7K	5%	1/4W	(CIS)
R137	1-249-429-11	CARBON	10K	5%	1/4W	(CIS)
R141	1-249-429-11	CARBON	10K	5%	1/4W	
R142	1-249-441-11	CARBON	100K	5%	1/4W	
R143	1-247-791-91	CARBON	22	5%	1/4W	
R161	1-249-441-11	CARBON	100K	5%	1/4W	
R162	1-249-413-11	CARBON	470	5%	1/4W	
R163	1-249-413-11	CARBON	470	5%	1/4W	
R171	1-249-417-11	CARBON	1K	5%	1/4W	
R181	1-247-807-31	CARBON	100	5%	1/4W	
R191	1-249-411-11	CARBON	330	5%	1/4W	
R201	1-249-417-11	CARBON	1K	5%	1/4W	
R202	1-249-417-11	CARBON	1K	5%	1/4W	
R203	1-249-417-11	CARBON	1K	5%	1/4W	
R204	1-249-417-11	CARBON	1K	5%	1/4W	
R205	1-249-417-11	CARBON	1K	5%	1/4W	
R206	1-249-417-11	CARBON	1K	5%	1/4W	
R207	1-249-411-11	CARBON	330	5%	1/4W	
R208	1-249-411-11	CARBON	330	5%	1/4W	
R209	1-249-411-11	CARBON	330	5%	1/4W	
R210	1-249-411-11	CARBON	330	5%	1/4W	
R212	1-249-417-11	CARBON	1K	5%	1/4W	
R213	1-249-417-11	CARBON	1K	5%	1/4W	
R214	1-249-417-11	CARBON	1K	5%	1/4W	
R215	1-249-417-11	CARBON	1K	5%	1/4W	
R216	1-249-429-11	CARBON	10K	5%	1/4W	
R217	1-249-429-11	CARBON	10K	5%	1/4W	
R222	1-247-893-11	CARBON	390K	5%	1/4W	
R224	1-249-423-11	CARBON	3.3K	5%	1/4W	
R225	1-249-423-11	CARBON	3.3K	5%	1/4W	
R226	1-249-423-11	CARBON	3.3K	5%	1/4W	
R227	1-249-441-11	CARBON	100K	5%	1/4W	
R228	1-249-441-11	CARBON	100K	5%	1/4W	
R229	1-247-807-31	CARBON	100	5%	1/4W	
R230	1-247-807-31	CARBON	100	5%	1/4W	
R231	1-249-425-11	CARBON	4.7K	5%	1/4W	
R271	1-249-429-11	CARBON	10K	5%	1/4W	
R281	1-249-429-11	CARBON	10K	5%	1/4W	
R282	1-249-425-11	CARBON	4.7K	5%	1/4W	
R283	1-249-393-11	CARBON	10	5%	1/4W	
R284	1-249-429-11	CARBON	10K	5%	1/4W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

MAIN PANEL

Ref. No.	Part No.	Description	Remark
R285	1-249-393-11	CARBON 10 5% 1/4W	
R301	1-249-441-11	CARBON 100K 5% 1/4W	(AEP, G, IT, UK)
R302	1-249-441-11	CARBON 100K 5% 1/4W	(AEP, G, IT, UK)
R303	1-249-441-11	CARBON 100K 5% 1/4W	(AEP, G, IT, UK)
R304	1-249-441-11	CARBON 100K 5% 1/4W	(AEP, G, IT, UK)
R305	1-249-429-11	CARBON 10K 5% 1/4W	(AEP, G, IT, UK)
R306	1-249-426-11	CARBON 5.6K 5% 1/4W	(AEP, G, IT, UK)
R308	1-249-421-11	CARBON 2.2K 5% 1/4W	(AEP, G, IT, UK)

< VARIABLE RESISTOR >

Ref. No.	Part No.	Description	Remark
RV1	1-238-601-11	RES, ADJ, CARBON 22K	
RV2	1-238-600-11	RES, ADJ, CARBON 10K	

< TERMINAL >

Ref. No.	Part No.	Description	Remark
TM1	1-537-488-11	TERMINAL BOARD (ANTENNA)	(AEP, G, IT, UK, CIS)
TM1	1-537-238-21	TERMINAL BOARD (ANTENNA)	(E, EA, TH)

< VIBRATOR >

Ref. No.	Part No.	Description	Remark
X201	1-579-175-11	VIBRATOR, CERAMIC (10MHz)	
X202	1-567-098-41	VIBRATOR, CRYSTAL (32.768KHz)	
X301	1-579-900-21	VIBRATOR, CRYSTAL (4.332MHz)	(AEP, G, IT, UK)
XT51	1-760-549-11	VIBRATOR, CRYSTAL (4.5MHz)	

****

Ref. No.	Part No.	Description	Remark
*	A-4378-851-A	PANEL BOARD, COMPLETE (E, EA, TH) ******************************	
*	A-4378-864-A	PANEL BOARD, COMPLETE (AEP, G, IT, UK, CIS) **************************************	
*	4-979-798-01	HOLDER (FL)	

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C601	1-126-933-11	ELECT 100uF 20% 10V	
C602	1-164-159-21	CERAMIC 0.1uF 50V	
C603	1-104-667-11	ELECT 22uF 20% 35V	
C604	1-164-159-21	CERAMIC 0.1uF 50V	
C605	1-162-282-31	CERAMIC 100PF 10% 50V	
C606	1-162-282-31	CERAMIC 100PF 10% 50V	
C607	1-162-282-31	CERAMIC 100PF 10% 50V	
C608	1-162-282-31	CERAMIC 100PF 10% 50V	
C609	1-162-294-31	CERAMIC 0.001uF 10% 50V	
C610	1-162-282-31	CERAMIC 100PF 10% 50V	
C611	1-162-282-31	CERAMIC 100PF 10% 50V	
C612	1-162-282-31	CERAMIC 100PF 10% 50V	
C613	1-162-282-31	CERAMIC 100PF 10% 50V	
C614	1-162-282-31	CERAMIC 100PF 10% 50V	
C615	1-162-282-31	CERAMIC 100PF 10% 50V	
C616	1-162-282-31	CERAMIC 100PF 10% 50V	
C617	1-162-282-31	CERAMIC 100PF 10% 50V	
C618	1-162-282-31	CERAMIC 100PF 10% 50V	
C619	1-162-282-31	CERAMIC 100PF 10% 50V	
C620	1-162-282-31	CERAMIC 100PF 10% 50V	
C621	1-162-282-31	CERAMIC 100PF 10% 50V	
C622	1-162-282-31	CERAMIC 100PF 10% 50V	
C623	1-162-282-31	CERAMIC 100PF 10% 50V	
C624	1-162-282-31	CERAMIC 100PF 10% 50V	
C625	1-136-173-00	FILM 0.47uF 5% 50V	
C626	1-136-173-00	FILM 0.47uF 5% 50V	

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
* CN601	1-568-864-11	SOCKET, CONNECTOR 21P	

< DIODE >

Ref. No.	Part No.	Description	Remark
D601	8-719-046-44	DIODE SEL5221S (ENTER/NEXT)	
D602	8-719-046-46	DIODE SEL5221S-TH8F (MULTI CONTROLLER)	
D603	8-719-046-43	DIODE SEL5421E-TP15 (SLEEP)	
D604	8-719-046-44	DIODE SEL5221S (REC)	
D605	8-719-046-43	DIODE SEL5421E-TP15 (DAILY)	
D606	8-719-046-43	DIODE SEL5421E-TP15 (ONCE)	

< FLUORESCENT INDICATOR >

Ref. No.	Part No.	Description	Remark
FL601	1-517-368-11	INDICATOR TUBE, FLUORESCENT	

< IC >

Ref. No.	Part No.	Description	Remark
IC601	8-759-261-63	IC M66004M6FP	

< COIL >

Ref. No.	Part No.	Description	Remark
L601	1-414-189-31	INDUCTOR 100uH	
L602	1-414-189-31	INDUCTOR 100uH	

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q601	8-729-119-76	TRANSISTOR 2SA1175-HFE	
Q602	8-729-119-76	TRANSISTOR 2SA1175-HFE	

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R601	1-249-413-11	CARBON 470 5% 1/4W	
R602	1-249-415-11	CARBON 680 5% 1/4W	
R603	1-249-417-11	CARBON 1K 5% 1/4W	
R604	1-249-419-11	CARBON 1.5K 5% 1/4W	
R605	1-249-421-11	CARBON 2.2K 5% 1/4W	

Ref. No.	Part No.	Description	Remark
R606	1-249-425-11	CARBON 4.7K 5% 1/4W	
R607	1-249-413-11	CARBON 470 5% 1/4W	
R608	1-249-415-11	CARBON 680 5% 1/4W	
R609	1-249-417-11	CARBON 1K 5% 1/4W	
R610	1-249-419-11	CARBON 1.5K 5% 1/4W	
R611	1-249-421-11	CARBON 2.2K 5% 1/4W	
R612	1-249-425-11	CARBON 4.7K 5% 1/4W	
R613	1-249-415-11	CARBON 680 5% 1/4W	
R614	1-247-815-91	CARBON 220 5% 1/4W	
R615	1-247-815-91	CARBON 220 5% 1/4W	
R616	1-249-429-11	CARBON 10K 5% 1/4W	
R617	1-249-429-11	CARBON 10K 5% 1/4W	
R618	1-249-413-11	CARBON 470 5% 1/4W	
R620	1-247-807-31	CARBON 100 5% 1/4W	
R621	1-249-417-11	CARBON 1K 5% 1/4W	
R622	1-249-417-11	CARBON 1K 5% 1/4W	
R623	1-249-417-11	CARBON 1K 5% 1/4W	
R624	1-249-434-11	CARBON 27K 5% 1/4W	
R625	1-249-429-11	CARBON 10K 5% 1/4W	

< SWITCH >

Ref. No.	Part No.	Description	Remark
S601	1-554-303-21	SWITCH, TACTILE (AEP,G,IT,UK:EON) (E,EA,TH,CIS:MEMORY)	
S602	1-554-303-21	SWITCH, TACTILE (AEP,G,IT,UK:PTY) (E,EA,TH,CIS:STEREO/MONO)	
S603	1-554-303-21	SWITCH, TACTILE (DISPLAY)	
S604	1-554-303-21	SWITCH, TACTILE (SLEEP)	
S605	1-554-303-21	SWITCH, TACTILE (REC)	
S606	1-554-303-21	SWITCH, TACTILE (DAILY)	
S607	1-554-303-21	SWITCH, TACTILE (TIMER SET)	
S608	1-554-303-21	SWITCH, TACTILE (ENTER/NEXT)	
S609	1-554-303-21	SWITCH, TACTILE (TUNER/BAND)	
S610	1-554-303-21	SWITCH, TACTILE (AEP,G,IT,UK:MEMORY) (E,EA,TH,CIS:PRESET)	
S611	1-554-303-21	SWITCH, TACTILE (E,EA,TH,CIS:AUTO) (AEP,G,IT,UK:TUNING MODE)	
S612	1-554-303-21	SWITCH, TACTILE (E,EA,TH,CIS:MANUAL) (AEP,G,IT,UK:STEREO/MONO)	
S613	1-554-303-21	SWITCH, TACTILE (CHARACTER)	
S614	1-554-303-21	SWITCH, TACTILE (CLOCK SET)	
S615	1-473-403-11	ENCODER, ROTARY (MULTI CONTROLLER)	
S616	1-554-303-21	SWITCH, TACTILE (ONCE)	

****

* A-4389-480-A POLAR BOARD, COMPLETE (CIS)

****

< CAPACITOR >

Ref. No.	Part No.	Description	Remark
C1701	1-162-294-31	CERAMIC 0.001uF 10% 50V	(CIS)
C1702	1-130-014-00	FILM 470PF 5% 50V	(CIS)
C1703	1-124-902-00	ELECT 0.47uF 20% 50V	(CIS)
C1704	1-124-902-00	ELECT 0.47uF 20% 50V	(CIS)
C1705	1-101-006-00	CERAMIC 0.047uF 50V	(CIS)
C1706	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1707	1-162-288-31	CERAMIC 330PF 10% 50V	(CIS)
C1710	1-137-364-11	FILM 0.001uF 5% 50V	(CIS)
C1711	1-137-364-11	FILM 0.001uF 5% 50V	(CIS)
C1712	1-130-736-11	FILM 0.01uF 5% 50V	(CIS)
C1713	1-130-736-11	FILM 0.01uF 5% 50V	(CIS)
C1714	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1715	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1716	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1719	1-126-967-11	ELECT 47uF 20% 16V	(CIS)
C1720	1-162-306-11	CERAMIC 0.01uF 30% 16V	(CIS)
C1723	1-162-306-11	CERAMIC 0.01uF 30% 16V	(CIS)
C1724	1-162-306-11	CERAMIC 0.01uF 30% 16V	(CIS)
C1725	1-126-967-11	ELECT 47uF 20% 16V	(CIS)
C1726	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1727	1-124-903-11	ELECT 1uF 20% 50V	(CIS)
C1728	1-126-966-11	ELECT 33uF 20% 16V	(CIS)

< CONNECTOR >

Ref. No.	Part No.	Description	Remark
* CN1701	1-568-832-11	SOCKET, CONNECTOR 13P	(CIS)

< TRIMMER >

Ref. No.	Part No.	Description	Remark
CT1701	1-141-260-00	CAP, TRIMMER 50PF	(CIS)

< DIODE >

Ref. No.	Part No.	Description	Remark
D1701	8-719-815-85	DIODE 1S1585	(CIS)
D1703	8-719-815-85	DIODE 1S1585	(CIS)
D1704	8-719-815-85	DIODE 1S1585	(CIS)
D1705	8-719-815-85	DIODE 1S1585	(CIS)

< IC >

Ref. No.	Part No.	Description	Remark
IC1701	8-759-063-04	IC IR3R42	(CIS)
IC1703	8-759-140-53	IC uPD4053BC	(CIS)

< COIL >

Ref. No.	Part No.	Description	Remark
L1701	1-409-497-11	COIL (FILTER)	(CIS)

< TRANSISTOR >

Ref. No.	Part No.	Description	Remark
Q1701	8-729-029-21	TRANSISTOR DTA114ESA-TP	(CIS)
Q1702	8-729-029-67	TRANSISTOR DTC114ESA-TP	(CIS)
Q1704	8-729-029-67	TRANSISTOR DTC114ESA-TP	(CIS)

< RESISTOR >

Ref. No.	Part No.	Description	Remark
R1701	1-249-432-11	CARBON 18K 5% 1/4W	(CIS)
R1702	1-249-435-11	CARBON 33K 5% 1/4W	(CIS)
R1703	1-249-427-11	CARBON 6.8K 5% 1/4W	(CIS)
R1704	1-247-858-11	CARBON 13K 5% 1/4W	(CIS)

POLAR

Ref.No.	Part No.	Description	Remark
R1705	1-249-417-11	CARBON 1K 5% 1/4W	(CIS)
R1706	1-249-417-11	CARBON 1K 5% 1/4W	(CIS)
R1707	1-249-441-11	CARBON 100K 5% 1/4W	(CIS)
R1708	1-249-440-11	CARBON 82K 5% 1/4W	(CIS)
R1709	1-249-439-11	CARBON 68K 5% 1/4W	(CIS)
R1710	1-249-429-11	CARBON 10K 5% 1/4W	(CIS)
R1711	1-249-429-11	CARBON 10K 5% 1/4W	(CIS)
R1714	1-249-426-11	CARBON 5.6K 5% 1/4W	(CIS)
R1715	1-249-426-11	CARBON 5.6K 5% 1/4W	(CIS)
R1716	1-249-441-11	CARBON 100K 5% 1/4W	(CIS)
R1717	1-249-441-11	CARBON 100K 5% 1/4W	(CIS)
R1718	1-249-429-11	CARBON 10K 5% 1/4W	(CIS)
R1719	1-249-429-11	CARBON 10K 5% 1/4W	(CIS)
R1721	1-249-434-11	CARBON 27K 5% 1/4W	(CIS)
R1722	1-249-441-11	CARBON 100K 5% 1/4W	(CIS)

< VARIABLE RESISTOR >

RV1701	1-238-600-11	RES, ADJ, CARBON 10K	(CIS)
RV1702	1-238-599-11	RES, ADJ, CARBON 4.7K	(CIS)

< TEST PIN >

* TP1701	1-560-061-00	PIN, CONNECTOR 3P	(CIS)
* TP1702	1-560-061-00	PIN, CONNECTOR 3P	(CIS)

****

MISCELLANEOUS
****

15	1-773-144-11	WIRE (FLAT TYPE)(21 CORE)	
17	1-751-688-11	WIRE (FLAT TYPE)(13 CORE)	(CIS)
FL601	1-517-368-11	INDICATOR TUBE, FLUORESCENT	

****

ACCESSORIES & PACKING MATERIALS
****

*	4-980-539-01	CUSHION (UPPER)	
*	4-980-540-01	CUSHION (LOWER)	

****

****
HARDWARE LIST
****

#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	

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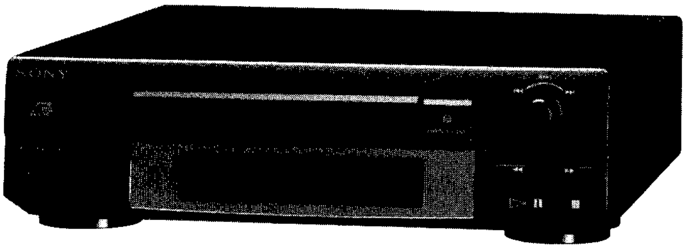
CDP-EX100

SERVICE MANUAL

AEP Model
UK Model
E Model



This set is the CD player section in
MHC-EX50/EX70AV/EX100AV.

Model Name Using Similar Mechanism	CDP-EX10
CD Mechanism Type	CDM28-5BD19
Base Unit Name	BU-5BD19

SPECIFICATIONS

CD player

System	Compact disc and digital audio system
Laser	Semiconductor laser (λ=780 nm) Emission duration: continuous
Laser output	Max 44.6 μW* * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.
Wavelength	780 – 790 nm
Frequence response	2 Hz – 20 kHz (±0.5 dB)
Signal-to-noise ratio	More than 105 dB
Dynamic range	More than 95 dB

Outputs

CD OUT (phono jacks):
Output level 2 V
(at 50 kilohms)
Load impedance over
10 kilohms

CD DIGITAL OPTICAL OUT
(Square optical connector jack, rear panel):

wave length	660 nm
output level	–18 dBm

Dimensions
Approx. 280 x 82.5 x 280 mm
(11 1/8 x 3 1/4 x 11 1/8 in) (w/h/d)
incl. projecting parts and controls

Mass	Approx. 2.1 kg (4 lb 10 oz)

Design and specifications are subject to change without notice.

MICROFILM

COMPACT DISC PLAYER

SONY®

The laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

The following caution label is located inside of the unit.

CAUTION	;	INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ADVARSEL	;	USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDS ÆTTELSE FOR STRÅLING.
VARO!	;	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA LASERSÄTEILYLLE.
VARNING	;	LASERSTRÅLING NÄR DENNA DEL ÄR OPPNAD OCH SPÄRREN ÄR URKOPPLAD.
ADVARSEL	;	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN.

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

This appliance is classified as a CLASS 1 LASER product.
The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on Chip Component Replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.
During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.
The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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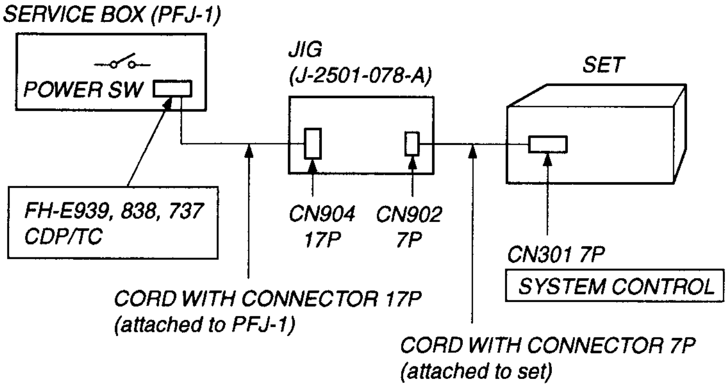
SECTION 1
SERVICE NOTE

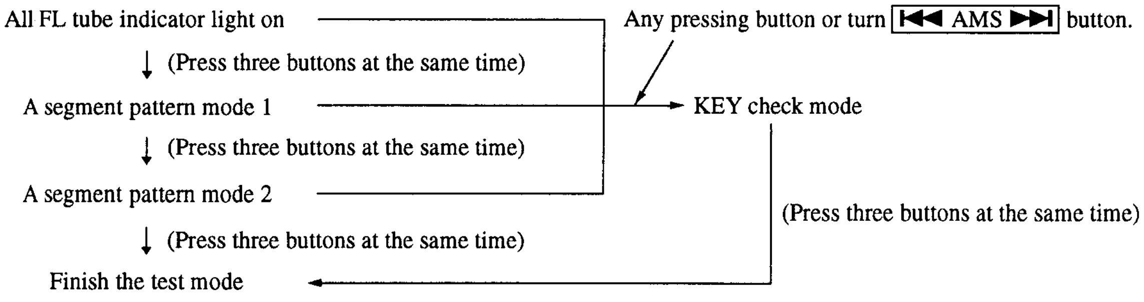
- **How to operate with a single unit**

  Normally this set does not operate with a single unit.
  When you must be mending, connect to other unit.
  If the SYSTEM POWER switch of the amplifire is set to ON, the power supply of the set is turned on.
  In case of other unit is nothing, the service box (PFJ-1) and exclusive jig (J-2501-078-A) are necessary to operate the set with a single unit.
  In case of above mentioned, press the ■ button and TIME button at the same time, to enter the power on.


SERVICE BOX (PFJ-1)
POWER SW
JIG
(J-2501-078-A)
SET
FH-E939, 838, 737
CDP/TC
CN904
17P
CN902
7P
CN301 7P
SYSTEM CONTROL
CORD WITH CONNECTOR 17P
(attached to PFJ-1)
CORD WITH CONNECTOR 7P
(attached to set)

- **FL tube/ KEY check mode**

  After to enter the power on, when ■ button, TIME button and ▶▶ button are pressed at the same time, you will be check FL tube.
  Whenever press the above mentioned three buttons at the same time, change to check mode of FL tube.
  Under check mode of FL tube when any pressing button or turn |◀◀ AMS ▶▶| button, change to KEY check mode.
  To finish KEY check mode, press the above mentioned three buttons at the same time.


All FL tube indicator light on
(Press three buttons at the same time)
A segment pattern mode 1
(Press three buttons at the same time)
A segment pattern mode 2
(Press three buttons at the same time)
Finish the test mode
Any pressing button or turn |◀◀ AMS ▶▶| button.
KEY check mode
(Press three buttons at the same time)

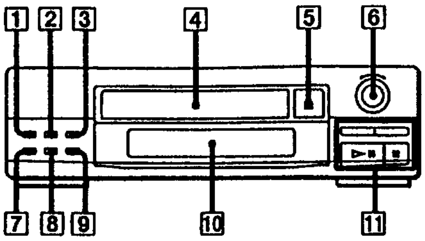
Note 1)
All FL tube light on mode is kept when three buttons which is pressed to enter all FL tube light on mode, release at the same time.
If you will be release failure them, it is moved to KEY check mode after all FL tube light on mode.

Note 2)
Under KEY check mode, every time and button pressed or |◀◀ AMS ▶▶| button turned on, figure on " KEY= " of FL tube is increased.

SECTION 2
GENERAL

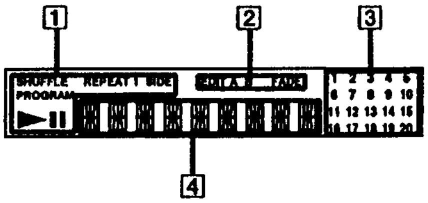
This section is extracted from instruction manual.

Front Panel


1
2
3
4
5
6
7
8
9
10
11

1 PLAY MODE button (8, 15)
2 REPEAT button (9)
3 TIME button (7)
4 Disc tray (7)
5 ⏏ OPEN/CLOSE button (open/close of the disc tray) (7, 13)
6 ⏮ AMS ⏭ control (8, 15)
7 EDIT button (14, 15)
8 CHECK button (9, 15)
9 CLEAR button (9)
10 Display window (7, 14, 15)
11 CD player operating buttons
  ◀◀/▶▶ (manual search) (8)
  ▷II (play/pause) (7, 14)
  ■ (stop) (7, 13)

Display Window

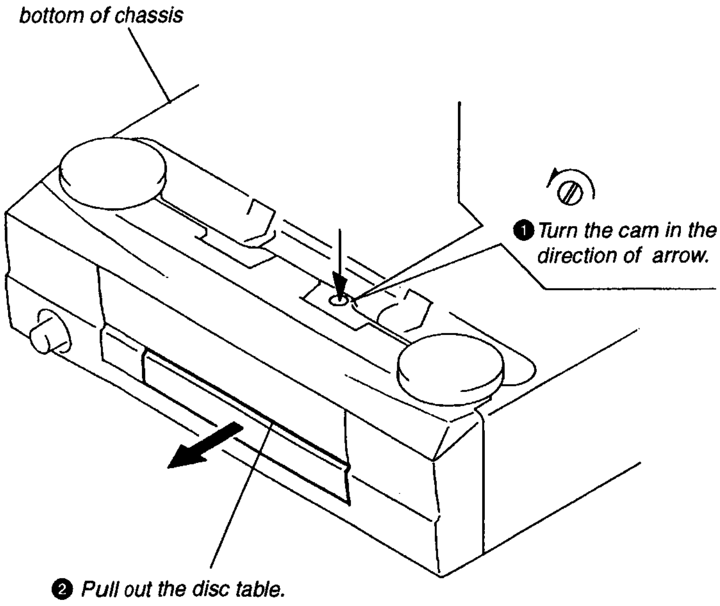

1
2
3
4
SHUFFLE REPEAT 1 SIDE
PROGRAM
EDIT A B FADE
▶II
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
16 17 18 19 20

1 CD play mode indication (7)
2 CD edit mode indication (14)
3 Music calendar (7, 14)
4 Step/track number/playing time indication (7, 9, 14)

SECTION 3
DISASSEMBLY

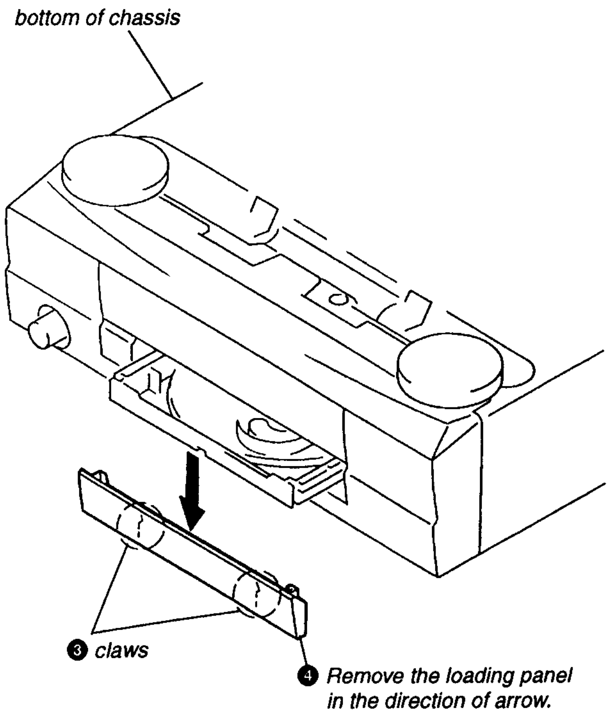
Note : Follow the disassembly procedure in the numerical order given.

3-1. LOADING PANEL


bottom of chassis

❶ *Turn the cam in the direction of arrow.*

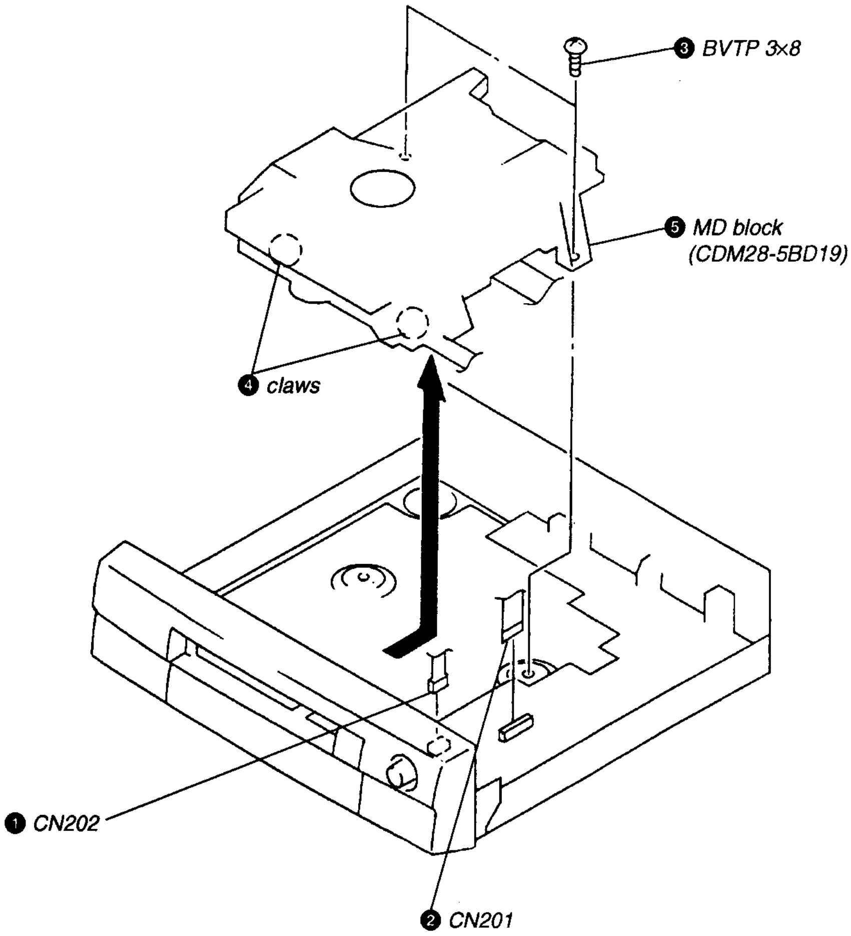
❷ *Pull out the disc table.*


bottom of chassis

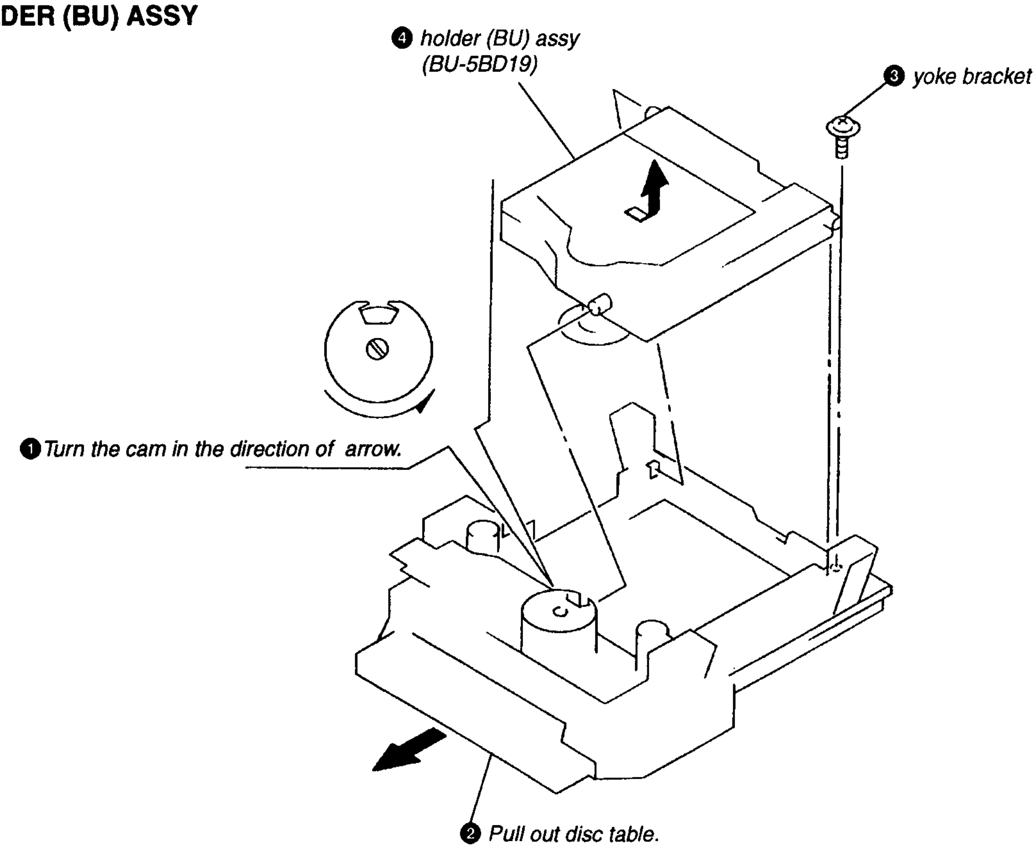
❸ *claws*

❹ *Remove the loading panel in the direction of arrow.*

3-2. MD BLOCK


❸ BVTP 3×8
❺ MD block
(CDM28-5BD19)
❹ claws
❶ CN202
❷ CN201

3-3. HOLDER (BU) ASSY

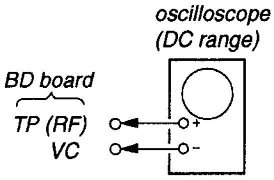

❹ holder (BU) assy
(BU-5BD19)
❸ yoke bracket
❶ Turn the cam in the direction of arrow.
❷ Pull out disc table.

SECTION 4
ELECTRICAL ADJUSTMENTS

Note :

1. Basically designed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use an oscilloscope with more than 10MΩ impedance.
4. Clean the objective lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.
5. Adjust the focus bias adjustment when optical block is replaced.

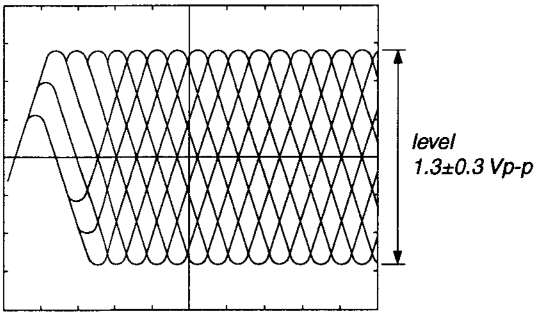
Focus Bias Adjustment



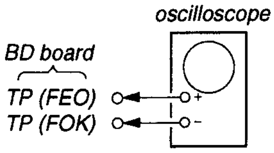
Procedure:

1. Connect oscilloscope to test point TP (RF). (GND terminal : VC)
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Adjust RV101 so that the waveform is clear.
   (Clear RF signal waveform means that the shape " ◇ " can be clearly distinguished at the center of the waveform.)
5. After adjustment, check the RF signal level.

- RF signal
  VOLT/DIV : 200 mV
  TIME/DIV : 500 nS



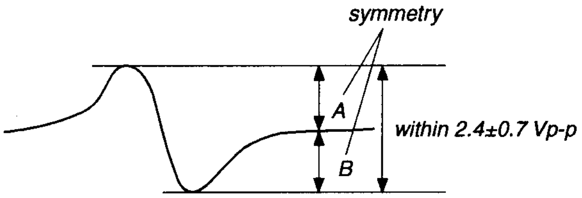
S Curve Check



Procedure:

1. Connect oscilloscope to test point TP(FEO).
2. Connect between test point TP(FOK)and GND by lead wire.
3. Turn Power switch on.
4. Put disc (YEDS-18) in and turnd Power switch on again and actuate the focus search. (In case of using SERVICE BOX actuate the focus search when disc table is moving in and out.)
5. Check the oscillosope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within 2.4±0.7 Vp-p.

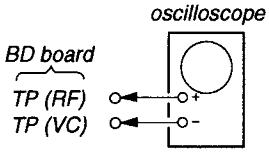
S-curve waveform



6. After check, remove the lead wire connected in step 2.

Note :
- Try to measure several times to make sure than the ratio of A:B or B:A is more than 10:7.
- Take sweep time as long as possible and light up the brightness to obtain best waveform.

RF Level Check



Procedure:

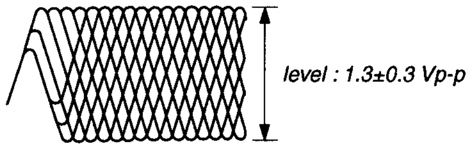
1. Connect oscilloscope to test point TP (RF) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

Note :

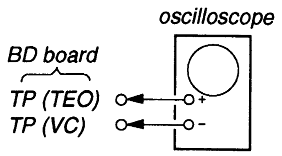
Clear RF signal waveform means that the shape " ◇ " can be clearly distinguished at the center of the waveform.

RF signal waveform

VOLT/DIV : 200mV
TIME/DIV : 500nS



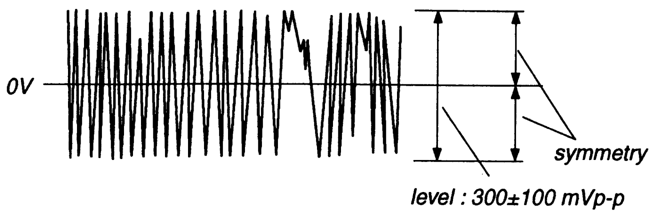
E-F Balance Check



Procedure:

1. Connect oscilloscpe to test point TP (TEO).
2. Turn Power switch on.
3. Connect pin ㉔ of IC60I on the PANEL board to GND with a lead wire.
4. Put disc (YEDS-18) in and playback.
5. Push TIME button.
6. Confirm that the oscilloscope waveform is symmetrical on the top and bottom in relation to 0Vdc, and check this level.

Traverse waveform



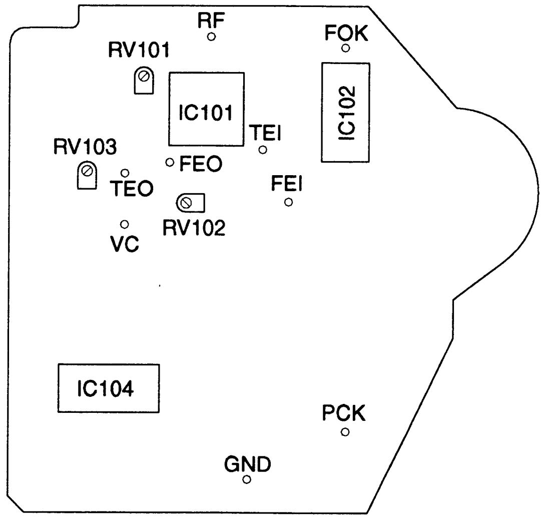
7.Remove the lead wire connected in step 3.

Focus/Tracking Gain Adjustment (RV102, 103)

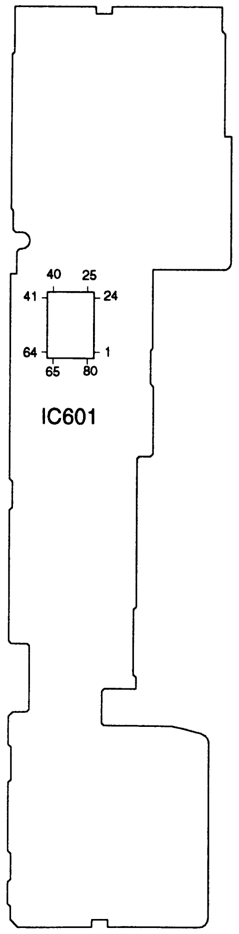
This gain has a margin, so even if it is slightly off. There is no problem. Therefore, do not perform this adjustment. Please note that it should be fixed to mechanical center position when you moved and do not know original position.

Adjustment Location :

[BD BOARD] (Conductor Side)



[PANEL BOARD] (Conductor Side)



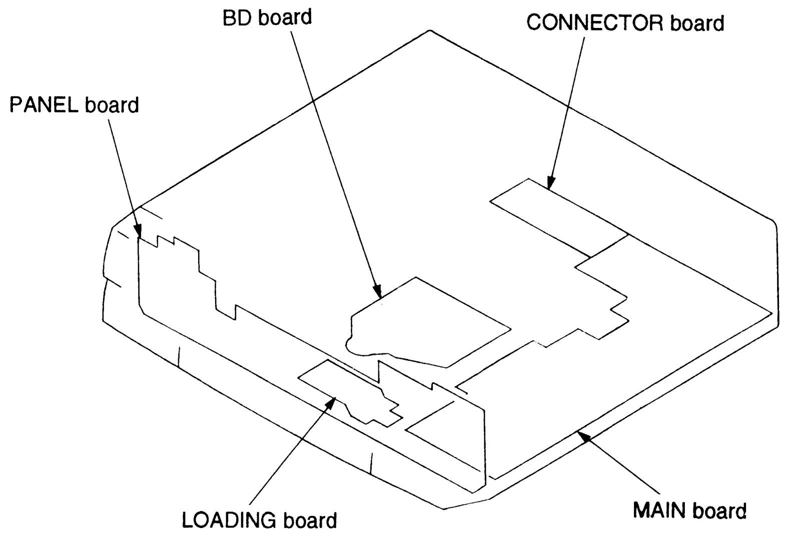
SECTION 5
DIAGRAMS

5-1. IC PIN FUNCTION

• IC601 µPD78044AGF (SYSTEM CONTROL, FL DRIVER)

Pin No.	Pin Name	I/O	Function
1-7	T6-T0	O	FL display grid output
8	VDD	—	+5V power supply
9	CLK	O	Serial clock output to DSP (CXD2507AQ).
10	DATA	O	Serial data output to DSP (CXD2507AQ).
11	—	—	Fixed at Ground.
12	XLAT	O	Serial data latch pulse output to DSP (CXD2507AQ).
13	PRGL	O	Serial data latch pulse output to D/F DAC (PCM1710U).
14	SQCLK	O	Sub code Q data read clock output to DSP (CXD2507AQ).
15	—	—	Not used. (Open)
16	SUBQ	I	Sub code Q data input from DSP (CXD2507AQ).
17	RESET	I	System reset input (" L "= Active)
18	INSW	I	S292 (load in switch) input
19	OUTSW	I	S291 (load out switch) input
20	AVSS	—	Ground
21	LDOUT	O	Output for rotating M903 (loading motor) in the loading out direction.
22	LDIN	O	Output for rotating M903 (loading motor) in the loading in direction.
23	ADJ	I	Test mode input. (" L "= Stops GFS check)
24	AFADJ	I	Test mode input. Fixed at "H". (" L "= Test mode)
25	MODE	I	Not used. (Fixed at " H ".)
26-28	KEY2-KEY0	I	Key AD input
29	AVDD	—	+5V power supply
30	AVREF	—	+5V power supply
31	—	—	Fixed at Ground.
32	—	—	Not used. (Open)
33	VSS	—	Ground
34	X1	I	Clock input (5MHz)
35	X2	O	Clock output (5MHz)
36	BDRST	O	BD reset output
37	BDPOWER	O	BD power ON/OFF output
38	—	—	Not used. (Open)
39	SENS	I	SENS input from DSP (CXD2507AQ).
40	AMUTE	O	Not used. (Open)
41	FSW	O	Focus switch output
42	BSOUT	O	Audio bus output
43	—	—	Not used. (Open)
44	SCOR	I	Sub code sync S0+S1 detection input
45	JOG1	I	JOG input
46	—	—	Not used. (Open)
47	BSIN	I	Audio bus input
48	IC (VPP)	—	Connected to Ground.
49	JOG0	I	JOG input
50, 51	—	—	Not used. (Open)
52	VDD	—	+5V power supply
53-70	S22-S5	O	FL display segment output
71	VLOAD	—	-28V power supply for driving FL display.
72-76	S4-S0	O	FL display segment output
77-80	T10-T7	O	FL display grid output

5-2. CIRCUIT BOARDS LOCATION


BD board
CONNECTOR board
PANEL board
LOADING board
MAIN board

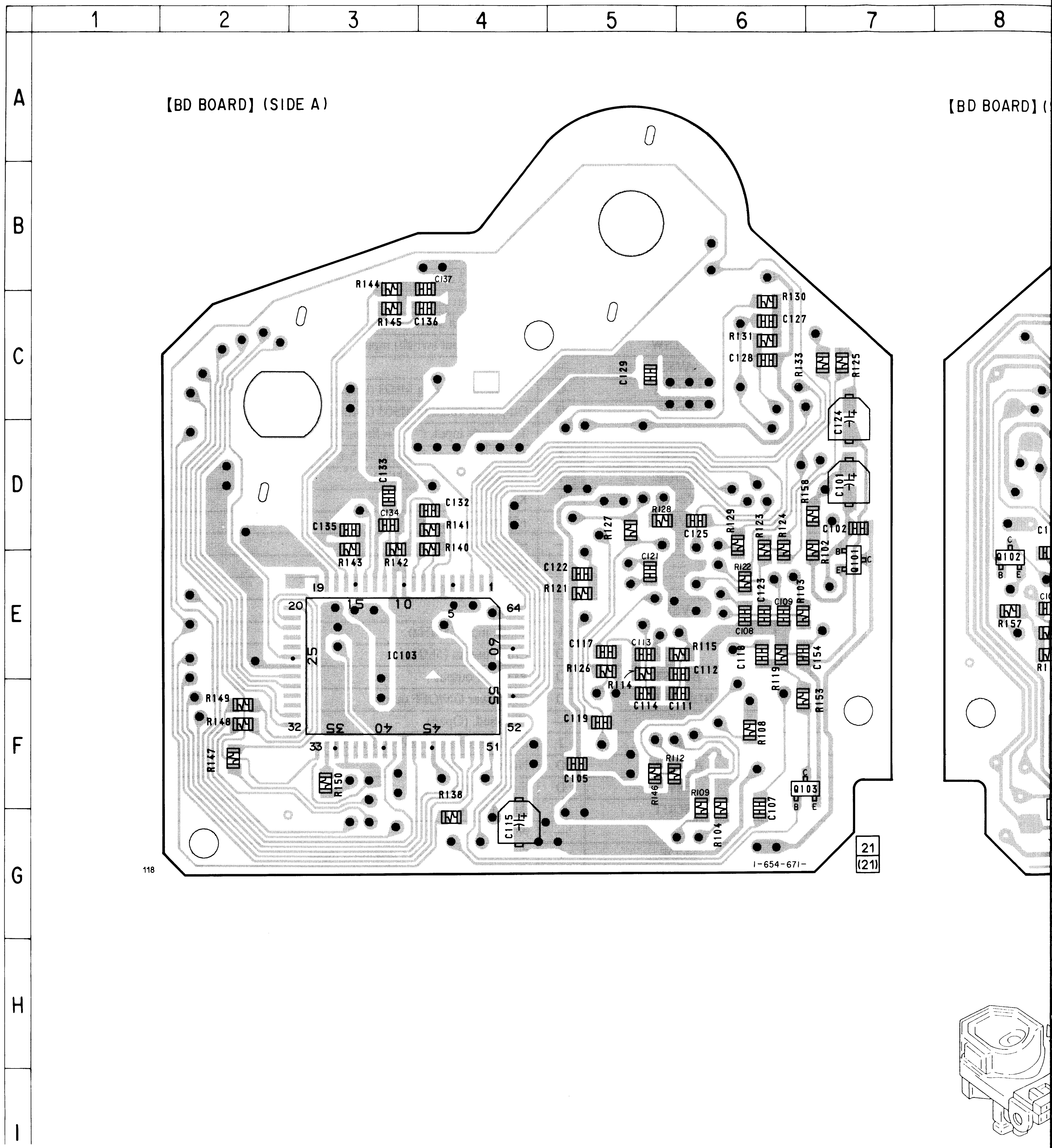
• Semiconductor Location

Ref. No.	Location
IC101	E-9
IC102	C-9
IC103	E-3
IC104	F-12
Q101	E-7
Q102	E-8
Q103	F-6

Note :

- ● : Through hole.
- ▨ : Pattern on the side which is seen.
  (The other layer's patterns are not indicated.)

5-3. PRINTED WIRING BOARD — BD SECTION —


1
2
3
4
5
6
7
8
A
B
C
D
E
F
G
H
I
【BD BOARD】 (SIDE A)
【BD BOARD】 (
IC103
Q101
Q102
Q103
C101
C102
C105
C107
C108
C109
C111
C112
C113
C114
C115
C117
C118
C119
C121
C122
C123
C124
C125
C127
C128
C129
C132
C133
C134
C135
C136
C137
C154
R102
R103
R104
R108
R109
R112
R114
R115
R119
R121
R122
R123
R124
R125
R126
R127
R128
R129
R130
R131
R133
R138
R140
R141
R142
R143
R144
R145
R146
R147
R148
R149
R150
R153
R157
R158
1
5
10
15
19
20
25
32
33
35
40
45
51
52
55
60
64
118
1-654-671-
21
(21)

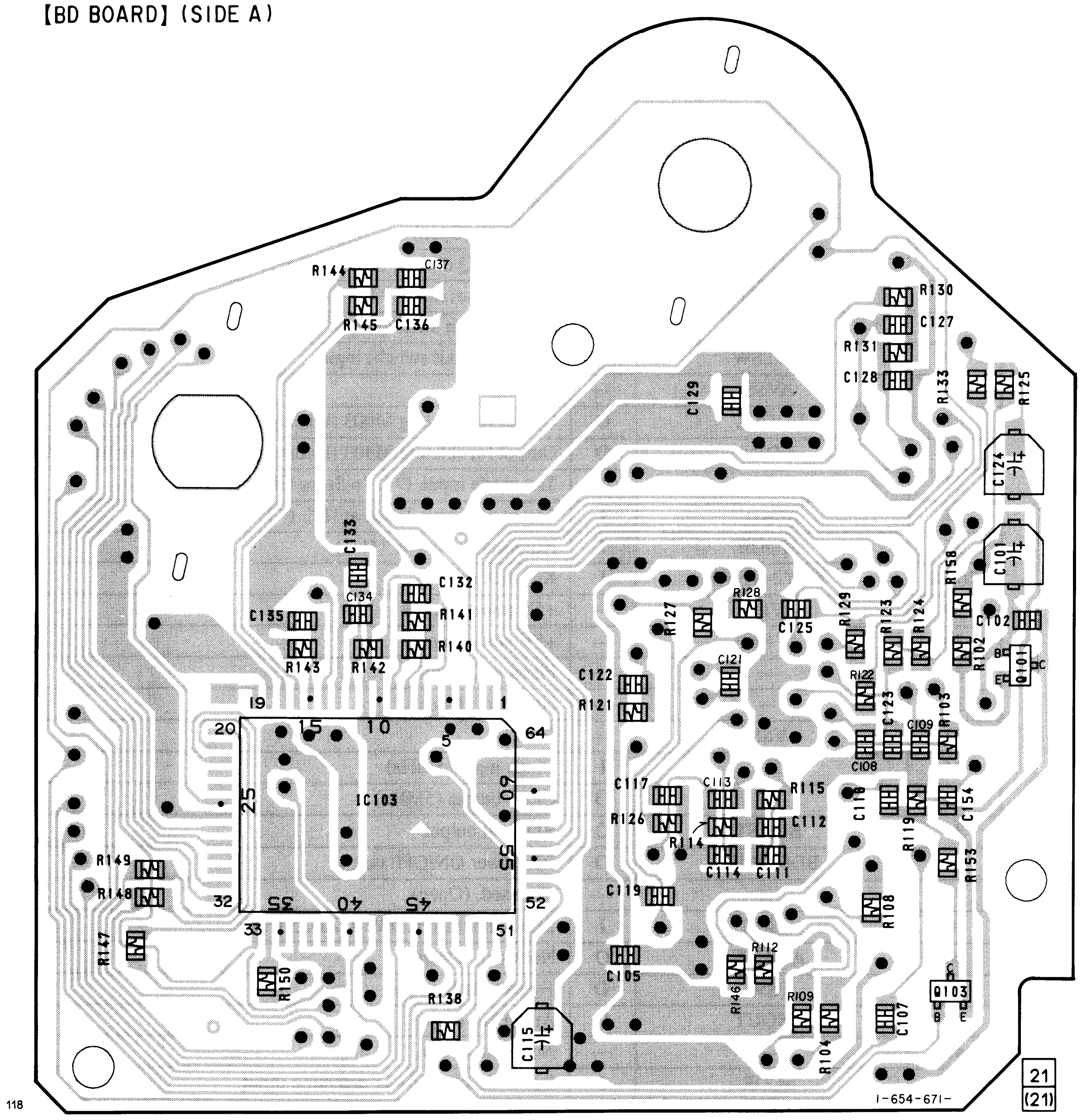
r Location

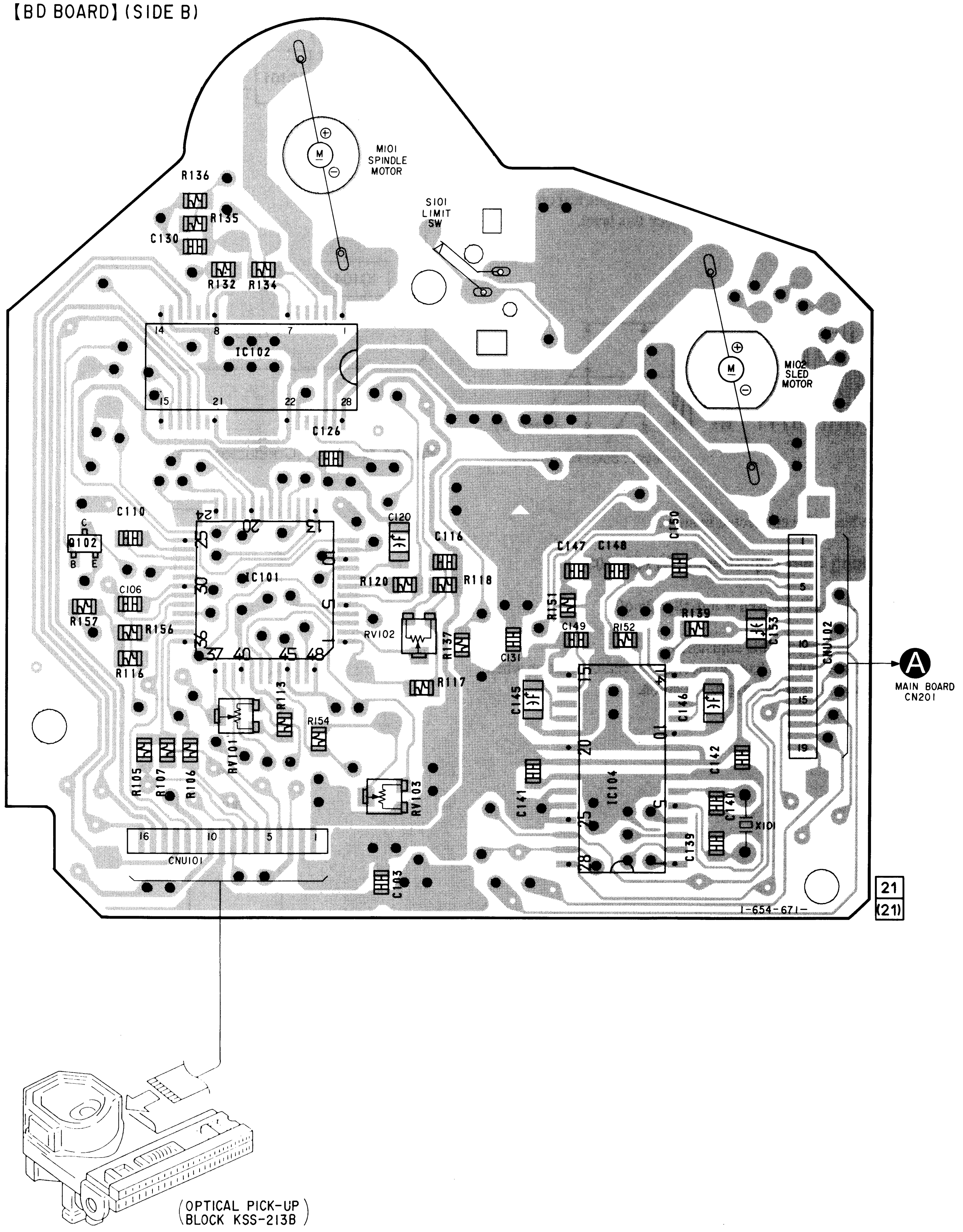
which is seen.
re not indicated.)

5-3. PRINTED WIRING BOARD — BD SECTION —

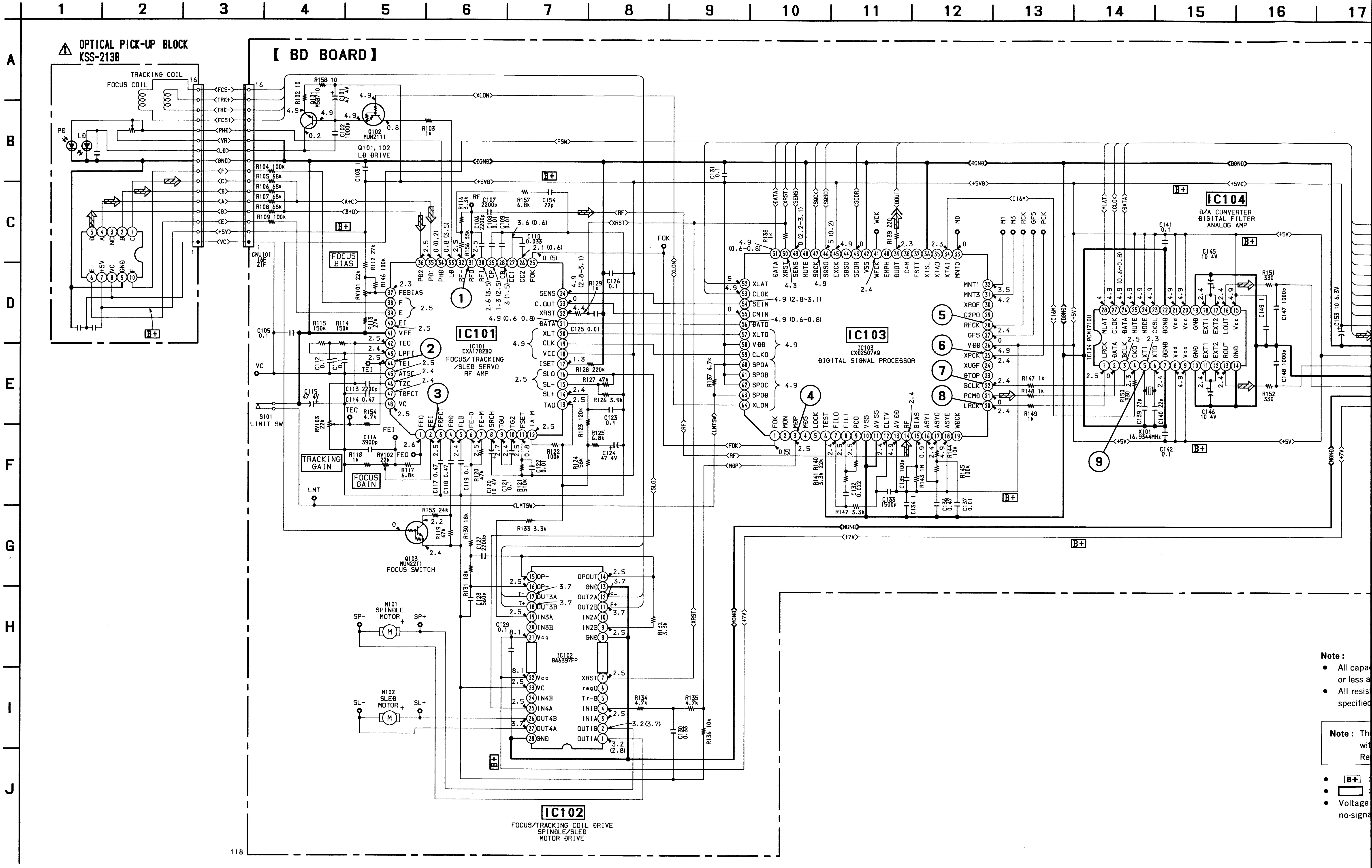
1 2 3 4 5 6 7 8 9 10 11 12 13

A B C D E F G H I


[BD BOARD] (SIDE A)
R144
C137
R145
C136
R130
C127
R131
C128
C129
R133
R125
C124
C101
R158
C133
C132
C134
C135
R141
R140
R143
R142
R127
R128
C125
R129
R123
R124
C102
R122
R102
Q101
C121
C122
R121
C123
C109
R103
C108
IC103
C117
C113
R115
R126
C112
R114
C114
C111
C118
R119
C154
R153
R149
R148
R147
C119
R108
R150
C105
R112
R146
R109
R104
C107
Q103
R138
C115
1-654-671-
21
(21)
118


[BD BOARD] (SIDE B)
M101 SPINDLE MOTOR
R136
R135
C130
R132
R134
S101 LIMIT SW
IC102
M102 SLED MOTOR
C126
C110
Q102
C120
C116
IC101
C106
R157
R156
R116
R120
R118
RV102
C147
C148
C150
R151
C149
R152
R139
C153
CNU102
C131
R137
R117
R113
RV101
R154
C145
C146
R105
R107
R106
RV103
IC104
C142
C141
C140
X101
C139
C143
CNU101
1-654-671-
21
(21)
A
MAIN BOARD CN201
(OPTICAL PICK-UP BLOCK KSS-213B)

5-4. SCHEMATIC DIAGRAM — BD SECTION — • Refer to page 23 for IC Block Diagrams.



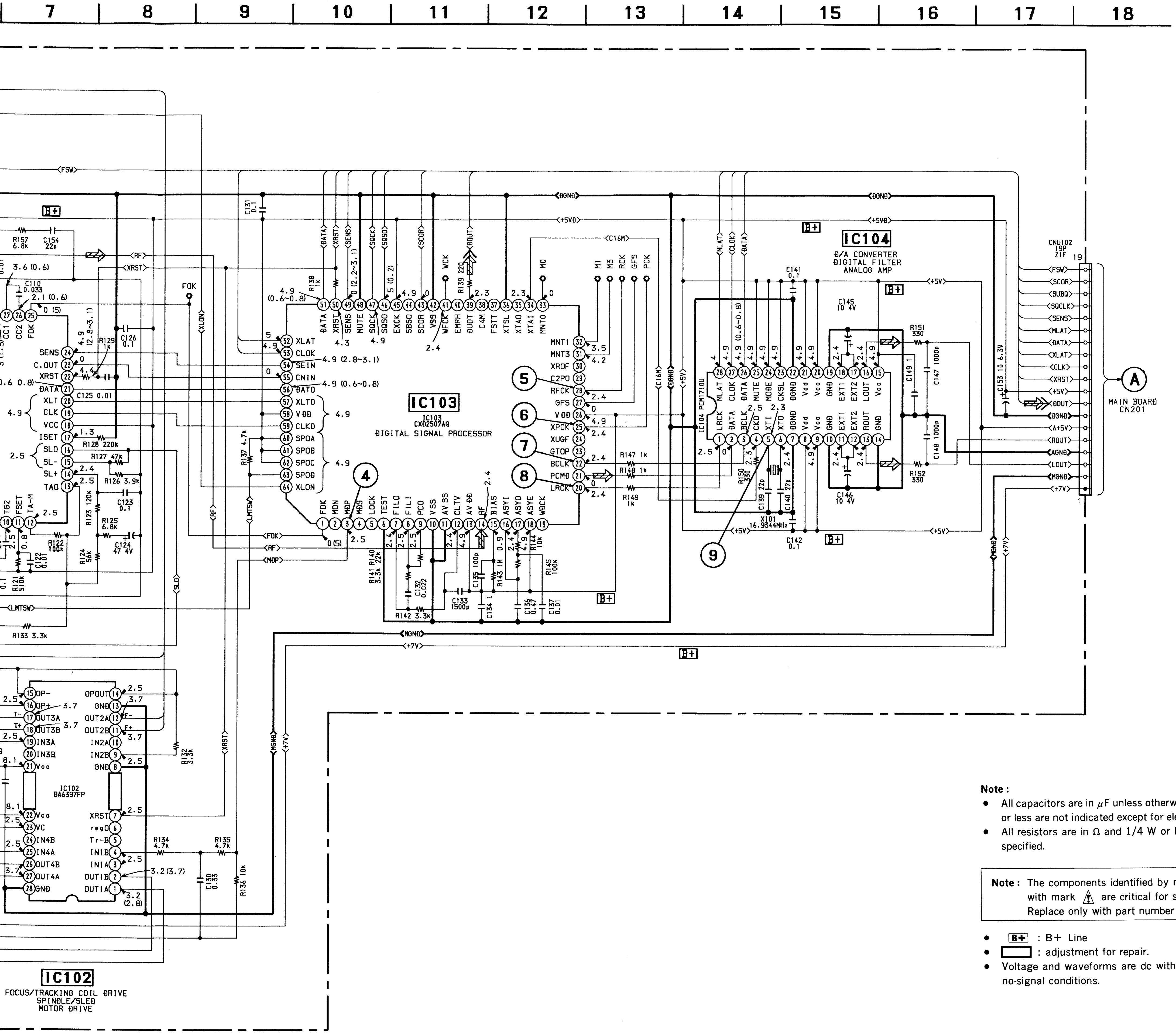
OPTICAL PICK-UP BLOCK
KSS-213B
TRACKING COIL
FOCUS COIL
PD
LD
【 BD BOARD 】
CNU101 16P ZIF
Q101 MSB710
Q102 MUN2111
Q101, 102 LD DRIVE
FOCUS BIAS
TRACKING GAIN
FOCUS GAIN
IC101
IC101 CXA1782BQ
FOCUS/TRACKING /SLED SERVO RF AMP
IC103
IC103 CXD2507AQ
DIGITAL SIGNAL PROCESSOR
IC104
D/A CONVERTER DIGITAL FILTER ANALOG AMP
IC104 PCM1710U
X101 16.9344MHz
S101 LIMIT SW
Q103 MUN2211 FOCUS SWITCH
M101 SPINDLE MOTOR
M102 SLED MOTOR
IC102 BA6397FP
IC102
FOCUS/TRACKING COIL DRIVE SPINDLE/SLED MOTOR DRIVE
VC
LMT
FOK
B+

Note :

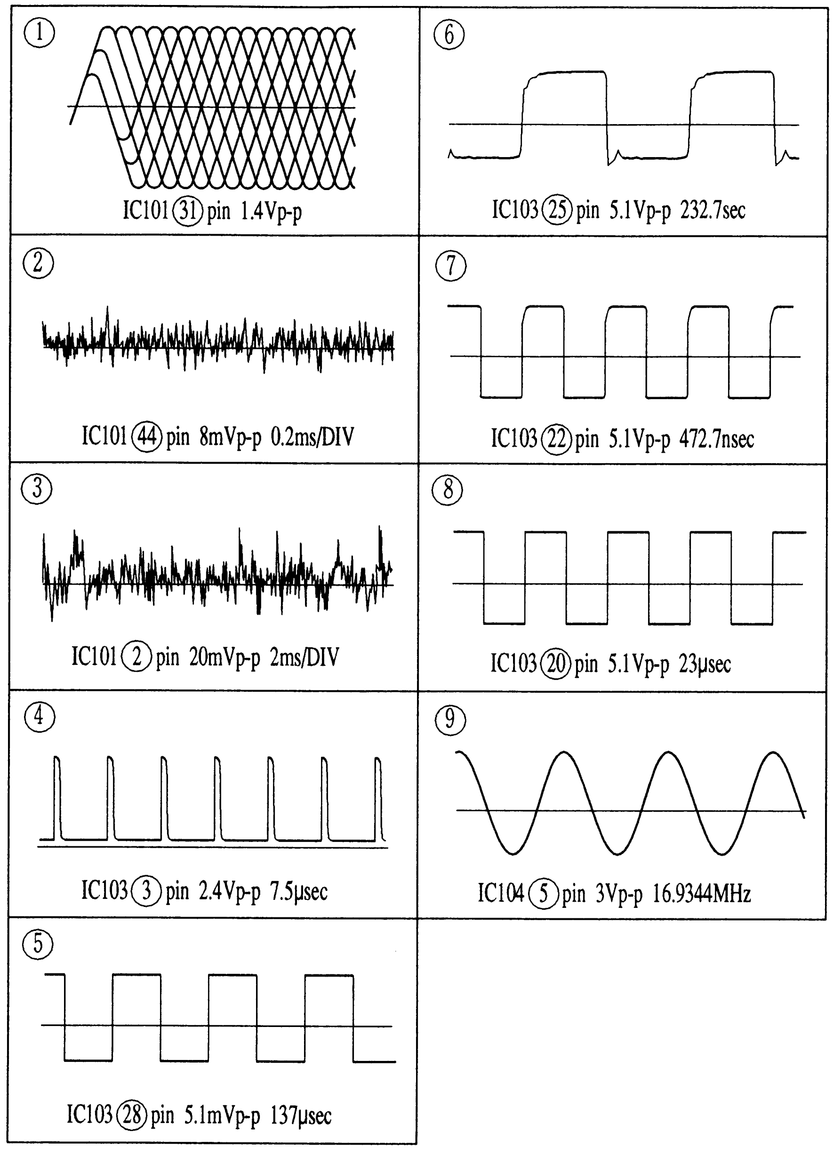
- All capa
  or less a
- All resis
  specified

Note : Th
wi
Re

- B+ :
- ☐ :
- Voltage
  no-signa


7
8
9
10
11
12
13
14
15
16
17
18
IC103
CXD2507AQ
DIGITAL SIGNAL PROCESSOR
IC104
D/A CONVERTER
DIGITAL FILTER
ANALOG AMP
IC104 PCM1710U
X101 16.9344MHz
CNU102 19P ZIF
MAIN BOARD CN201
A
IC102 BA6397FP
IC102
FOCUS/TRACKING COIL DRIVE
SPINDLE/SLED
MOTOR DRIVE
B+
FOK
XLON
FSW
RF
XRST
DGND
+5VD
C16M
+5V
MGND
+7V
AGND
LMTSW
LMTSW
SLO
MDP

• Waveforms



① IC101 ㉛ pin 1.4Vp-p

② IC101 ㊹ pin 8mVp-p 0.2ms/DIV

③ IC101 ② pin 20mVp-p 2ms/DIV

④ IC103 ③ pin 2.4Vp-p 7.5μsec

⑤ IC103 ㉘ pin 5.1mVp-p 137μsec

⑥ IC103 ㉕ pin 5.1Vp-p 232.7sec

⑦ IC103 ㉒ pin 5.1Vp-p 472.7nsec

⑧ IC103 ⑳ pin 5.1Vp-p 23μsec

⑨ IC104 ⑤ pin 3Vp-p 16.9344MHz

Note :

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.

Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

- B+ : B+ Line
- ☐ : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.
- no mark: STOP
  ( ): PLAY
- Voltages are taken with a VOM (Input Impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : CD
  ⇨ : digital out

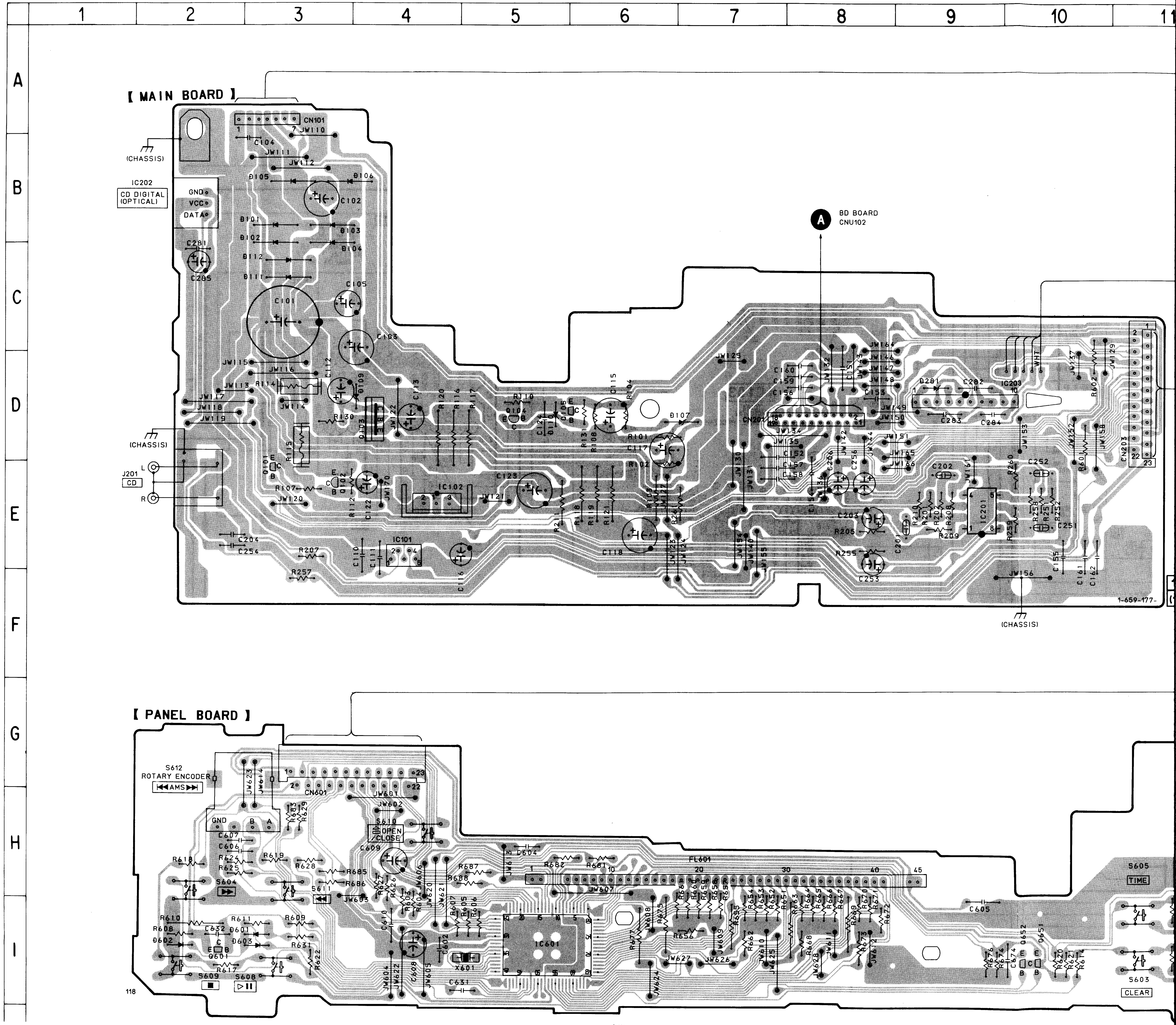
5-5. PRINTED WIRING BOARDS — MAIN SECTION —

• Semiconductor Location

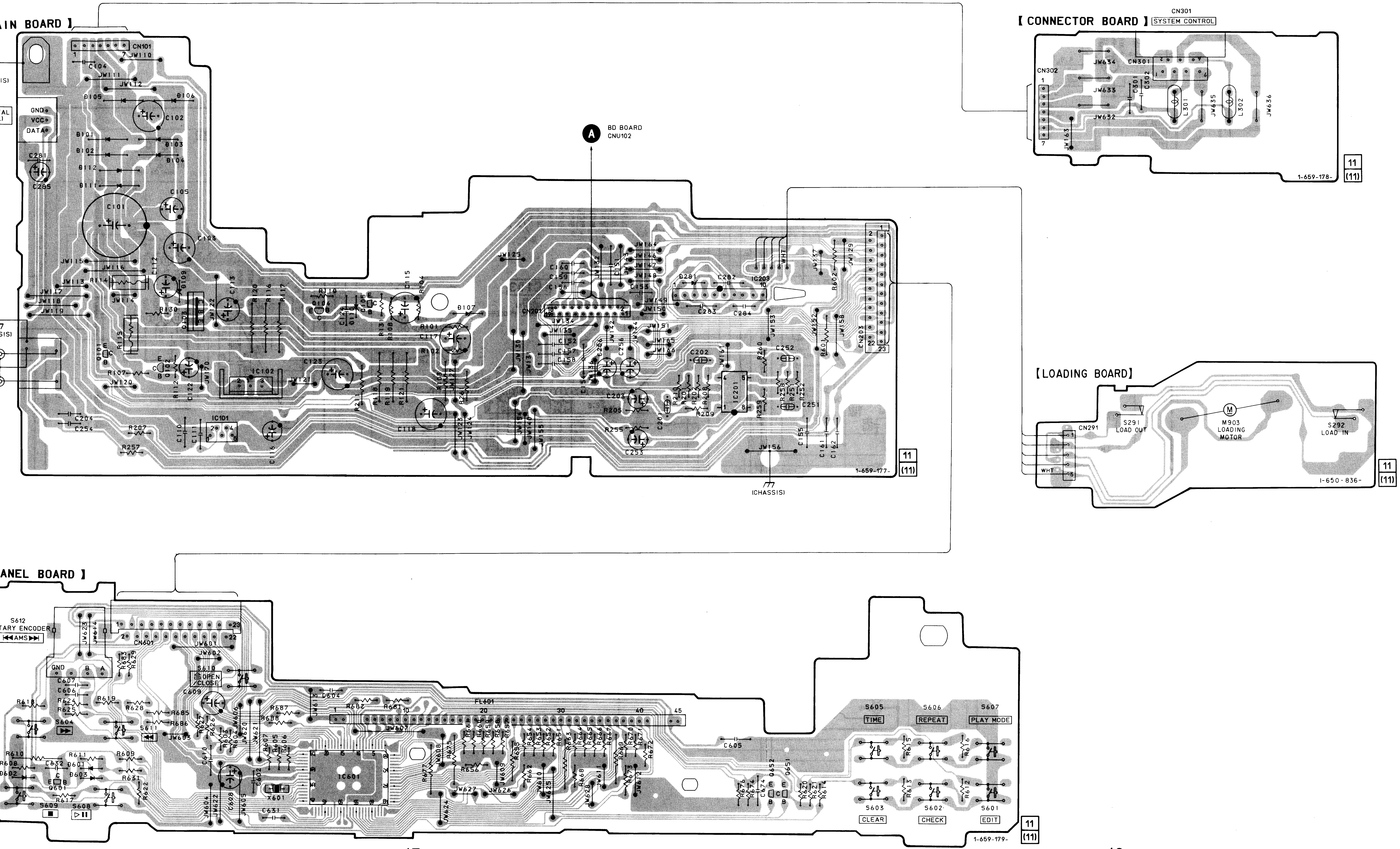
Ref. No.	Location
D101	B-3
D102	B-3
D103	B-3
D104	B-3
D105	B-3
D106	B-3
D107	D-7
D109	D-4
D110	D-5
D111	C-3
D112	C-3
D281	D-9
D601	I-3
D602	I-2
D603	I-3
IC101	E-4
IC102	E-4
IC201	E-9
IC202	B-2
IC203	D-9
IC601	I-5
Q101	E-3
Q102	E-3
Q103	D-4
Q104	D-5
Q105	D-5
Q601	I-2
Q651	I-10
Q652	I-10

Note :

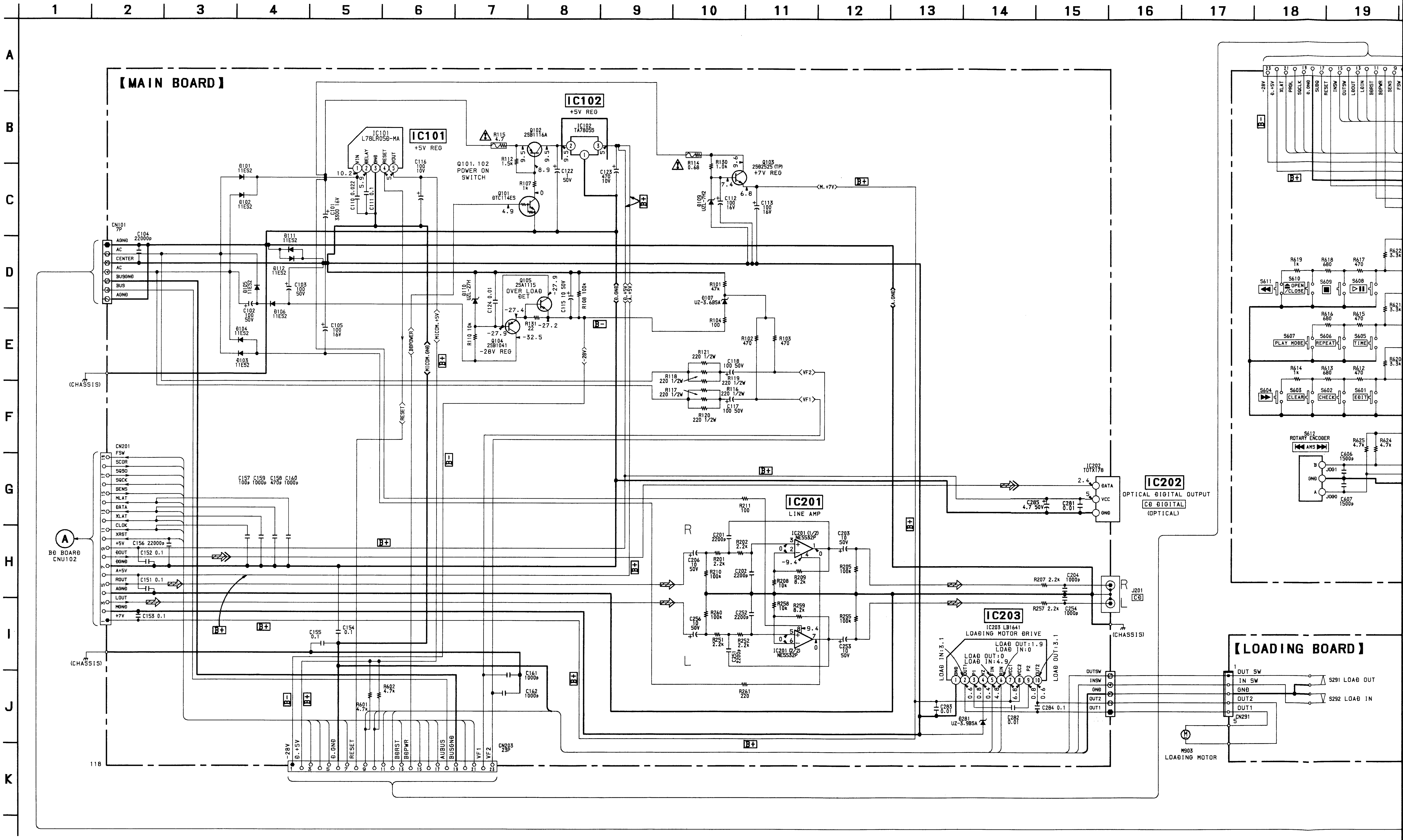
- ● : Through hole.
- ▨ : Pattern on the side which is seen.
(The other layer's patterns are not indicated.)



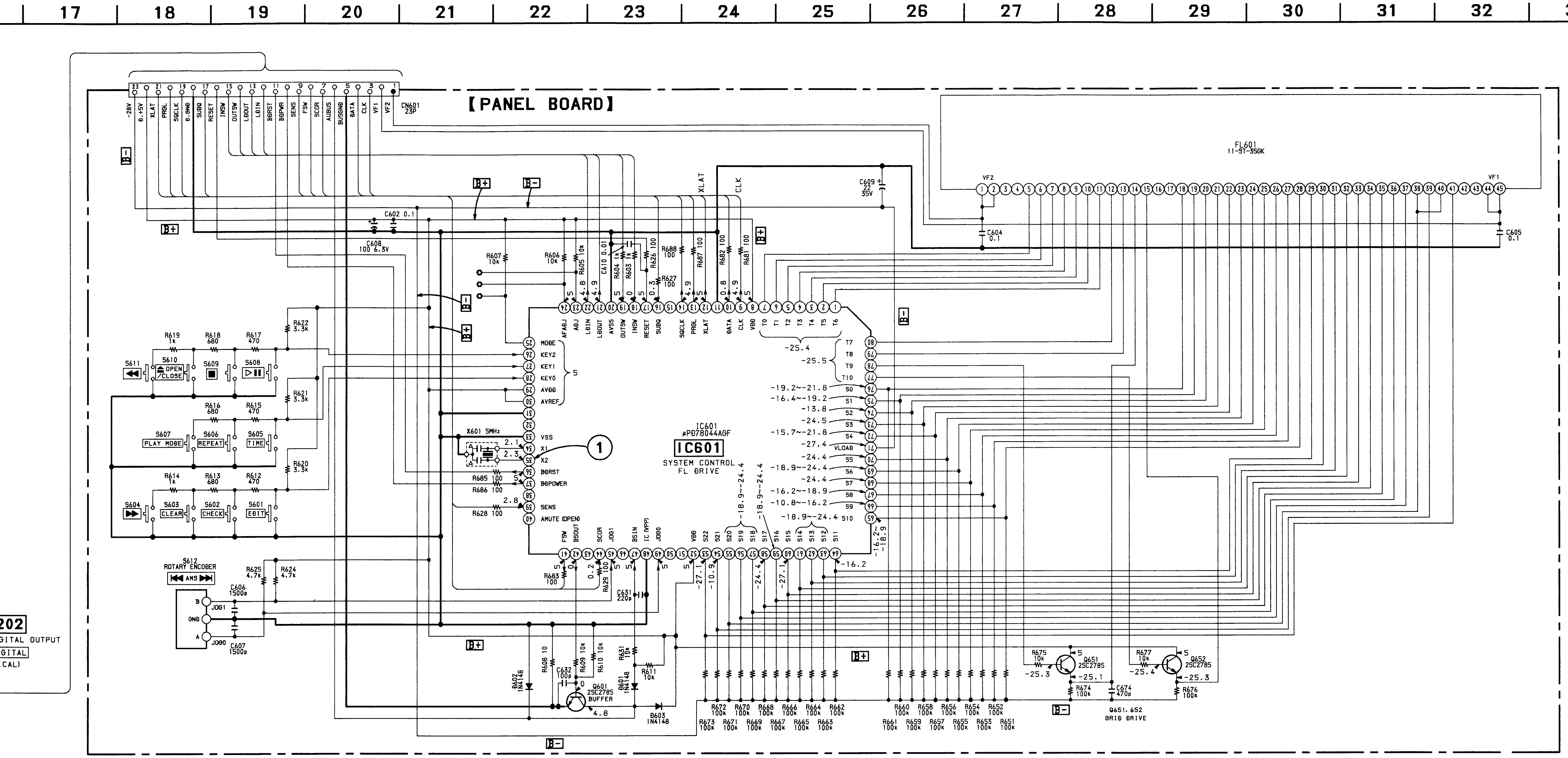
1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
E
F
G
H
I
[MAIN BOARD]
CN101
(CHASSIS)
IC202
CD DIGITAL (OPTICAL)
GND
VCC
DATA
A
BD BOARD CNU102
C101
C102
C103
C105
IC101
IC102
IC201
IC203
CN201
CN203
J201
CD
L
R
1-659-177-
[PANEL BOARD]
S612 ROTARY ENCODER
◀◀AMS▶▶
CN601
S610 OPEN/CLOSE
S604
S611
S609
S608
FL601
IC601
X601
S605
TIME
S603
CLEAR

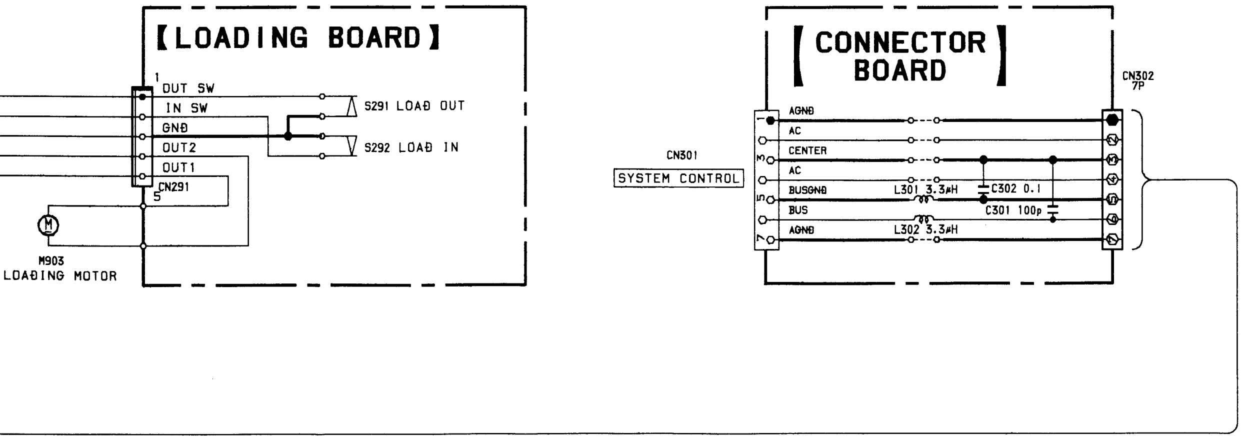

AIN BOARD]
CN101
GND
VCC
DATA
A
BD BOARD
CNU102
IC101
IC102
IC201
IC203
CN201
CN203
WHT
(CHASSIS)
1-659-177-
11
(11)
[CONNECTOR BOARD]
CN301
SYSTEM CONTROL
CN302
L301
L302
1-659-178-
11
(11)
[LOADING BOARD]
CN291
S291
LOAD OUT
M903
LOADING
MOTOR
S292
LOAD IN
WHT
1-650-836-
11
(11)
ANEL BOARD]
S612
TARY ENCODER
◀◀AMS▶▶
GND
B
A
CN601
S610
OPEN
CLOSE
S604
▶▶
S611
◀◀
S609
■
S608
▷II
IC601
X601
FL601
S605
TIME
S606
REPEAT
S607
PLAY MODE
S603
CLEAR
S602
CHECK
S601
EDIT
1-659-179-
11
(11)

5-6. SCHEMATIC DIAGRAM — MAIN SECTION — • Refer to page 23 for IC Block Diagrams.

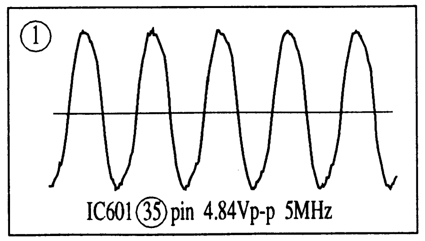


【MAIN BOARD】
IC101
+5V REG
IC101 L78LR05D-MA
IC102
+5V REG
IC102 TA7805S
Q101, 102 POWER ON SWITCH
Q101 DTC114ES
Q102 2SB1116A
Q103 2SD2525 (TP) +7V REG
Q104 2SB1041 -28V REG
Q105 2SA1115 OVER LOAD DET
D101 11ES2
D102 11ES2
D103 11ES2
D104 11ES2
D105 11ES2
D106 11ES2
D107 UZ-3.6BSA
D109 UZL-7H2
D110 UZL-27H
D111 11ES2
D112 11ES2
CN101 7P
AGND
AC
CENTER
AC
BUSGND
BUS
AGND
CN201
FSW
SCOR
SQSO
SQCK
SENS
MLAT
DATA
XLAT
CLOK
XRST
+5V
DOUT
DGND
A+5V
ROUT
AGND
LOUT
MGND
+7V
A
BD BOARD CNU102
(CHASSIS)
C157 C159 C158 C160 100p 1000p 470p 1000p
IC201
LINE AMP
IC201 (1/2) NE5532P
IC201 (2/2) NE5532P
R
L
IC202
IC202 TOTX178
OPTICAL DIGITAL OUTPUT
CD DIGITAL (OPTICAL)
DATA
VCC
GND
J201 CD
IC203
IC203 LB1641 LOADING MOTOR DRIVE
LOAD OUT:1.9 LOAD IN:0
LOAD OUT:0 LOAD IN:4.9
LOAD IN:3.1
LOAD OUT:3.1
D281 UZ-3.9BSA
OUTSW
INSW
GND
OUT2
OUT1
CN203 23P
-28V
D.+5V
D.GND
RESET
BBRST
BBPWR
AUBUS
BUSGND
VF1
VF2
(BBPOWER)
(MICOM.GND)
(MICOM.+5V)
(RESET)
(-28V)
(A.GND)
(M.+7V)
(VF1)
(VF2)
B+
B-
118
【LOADING BOARD】
OUT SW
IN SW
GND
OUT2
OUT1
CN291
S291 LOAD OUT
S292 LOAD IN
M903 LOADING MOTOR
-28V
D.+5V
XLAT
PRGL
SQCLK
D.GND
SUBQ
RESET
INSW
OUTSW
LDOUT
LDIN
BBRST
BBPWR
SENS
FSW
S611
S610 OPEN/CLOSE
S609
S608
S607 PLAY MODE
S606 REPEAT
S605 TIME
S604
S603 CLEAR
S602 CHECK
S601 EDIT
S612 ROTARY ENCODER
AMS
JOG1
JOG0


17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
【PANEL BOARD】
CN601 23P
IC601
μPD78044AGF
IC601
SYSTEM CONTROL
FL DRIVE
FL601
11-ST-35GK
X601 5MHz
S611
S610 OPEN/CLOSE
S609
S608
S607 PLAY MODE
S606 REPEAT
S605 TIME
S604
S603 CLEAR
S602 CHECK
S601 EDIT
S612
ROTARY ENCODER
AMS
Q601
2SC2785
BUFFER
Q651, 652
GRID DRIVE
D602 1N4148
D603 1N4148
D601 1N4148
B+
B-
①
202
DIGITAL OUTPUT


【LOADING BOARD】
OUT SW
IN SW
GND
OUT2
OUT1
CN291
S291 LOAD OUT
S292 LOAD IN
M903
LOADING MOTOR
【CONNECTOR BOARD】
CN301
SYSTEM CONTROL
CN302 7P
AGND
AC
CENTER
AC
BUSGND
BUS
AGND
L301 3.3μH
L302 3.3μH
C302 0.1
C301 100p

• Waveform



Note :

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.

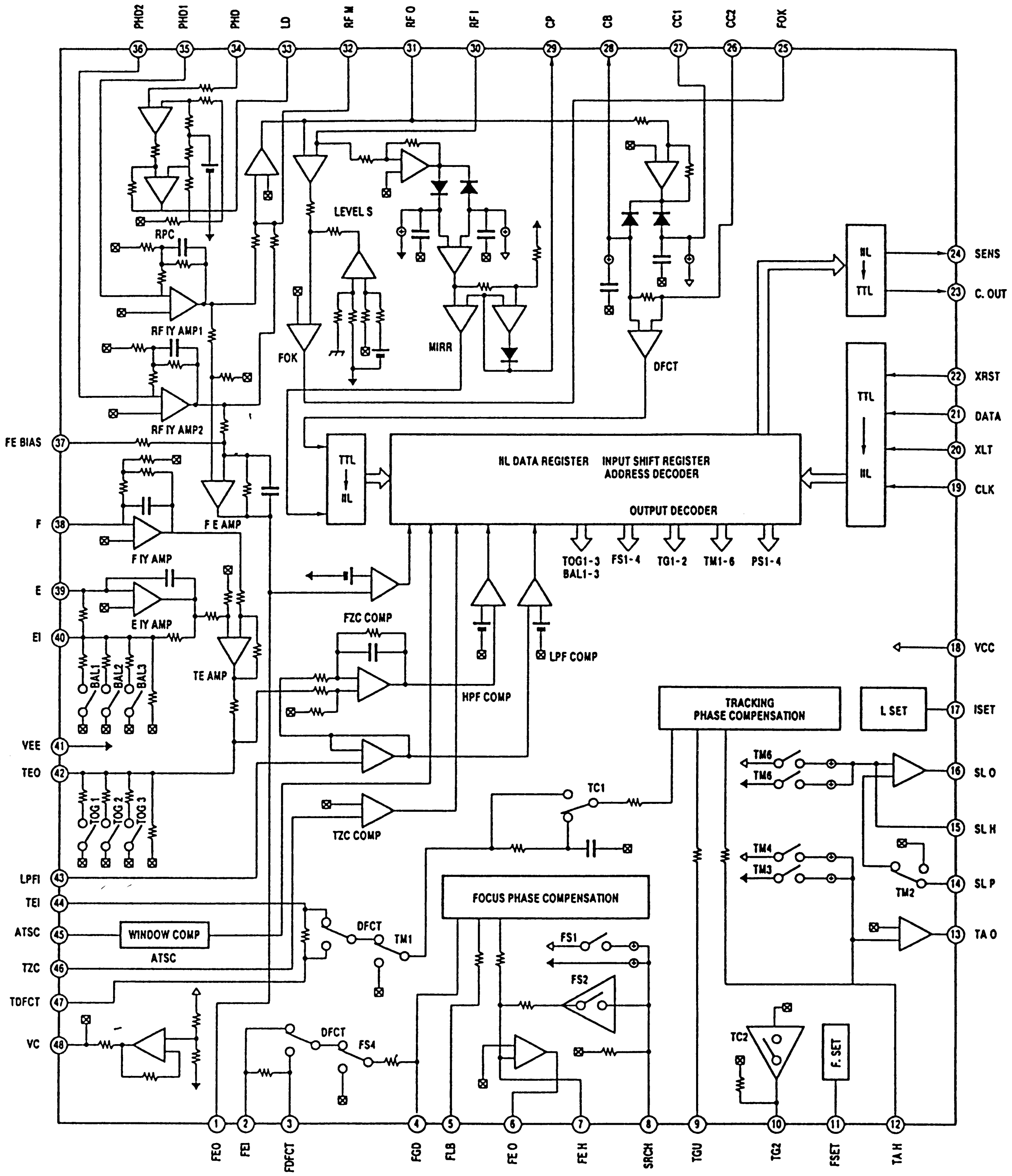
Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

- B+ : B+ Line
- ☐ : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal conditions.

- no mark: STOP
  ( ): PLAY
- Voltages are taken with a VOM (Input Impedance 10MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : CD
  ⇨ : digital out

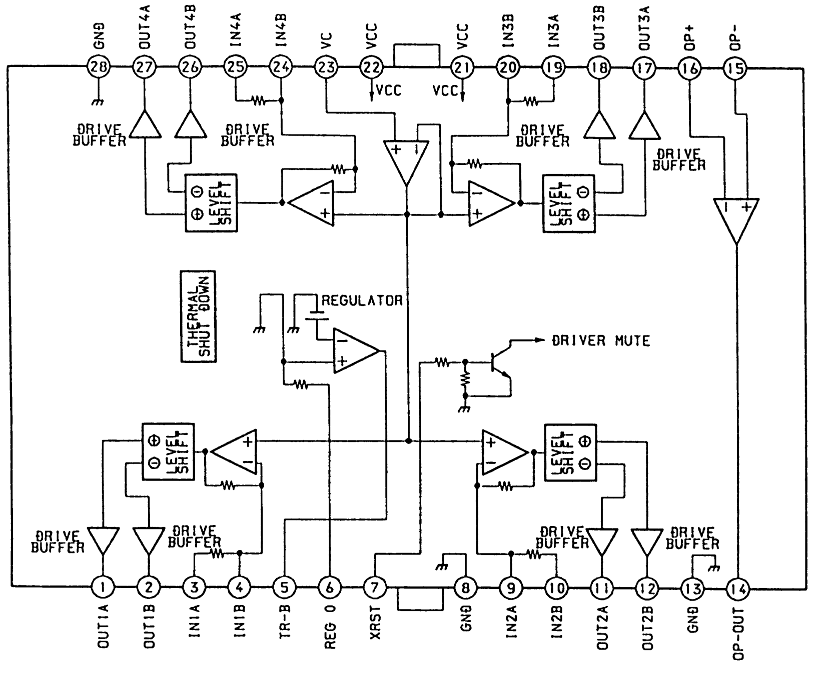
- **IC Block Diagrams**

IC101 CXA1782BQ (BD Board)



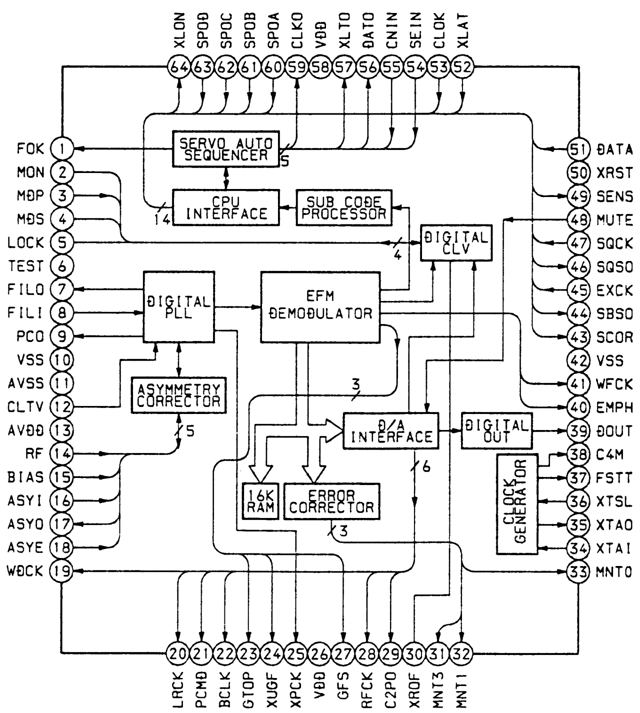
PHD2
PHD1
PHD
LD
RF M
RF O
RF I
CP
CB
CC1
CC2
FOK
RPC
RF I/V AMP1
RF I/V AMP2
LEVEL S
FOK
MIRR
DFCT
FE BIAS
F
E
EI
F E AMP
F I/V AMP
E I/V AMP
TE AMP
BAL1
BAL2
BAL3
VEE
TEO
TOG1
TOG2
TOG3
LPFI
TEI
ATSC
TZC
TDFCT
VC
WINDOW COMP
ATSC
TTL
IIL
IIL DATA REGISTER INPUT SHIFT REGISTER ADDRESS DECODER
OUTPUT DECODER
TOG1-3 BAL1-3
FS1-4
TG1-2
TM1-6
PS1-4
FZC COMP
LPF COMP
HPF COMP
TZC COMP
TRACKING PHASE COMPENSATION
FOCUS PHASE COMPENSATION
L SET
TC1
TC2
TM1
TM2
TM3
TM4
TM5
TM6
FS1
FS2
FS4
DFCT
F. SET
SENS
C. OUT
XRST
DATA
XLT
CLK
VCC
ISET
SL O
SL M
SL P
TA O
FEO
FEI
FDFCT
FGD
FLB
FE O
FE M
SRCH
TGU
TG2
FSET
TA M

IC102 BA6397FP



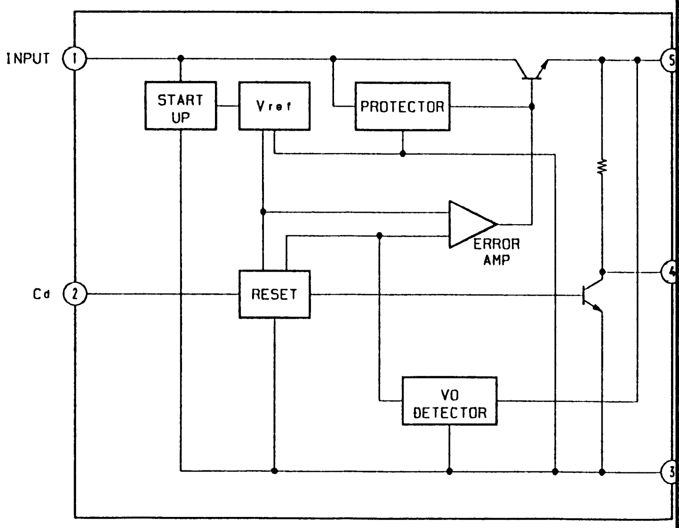
GND
OUT4A
OUT4B
IN4A
IN4B
VC
VCC
VCC
IN3B
IN3A
OUT3B
OUT3A
OP+
OP-
DRIVE BUFFER
LEVEL SHIFT
THERMAL SHUT DOWN
REGULATOR
DRIVER MUTE
OUT1A
OUT1B
IN1A
IN1B
TR-B
REG O
XRST
GND
IN2A
IN2B
OUT2A
OUT2B
GND
OP-OUT

IC103 CXD2507AR



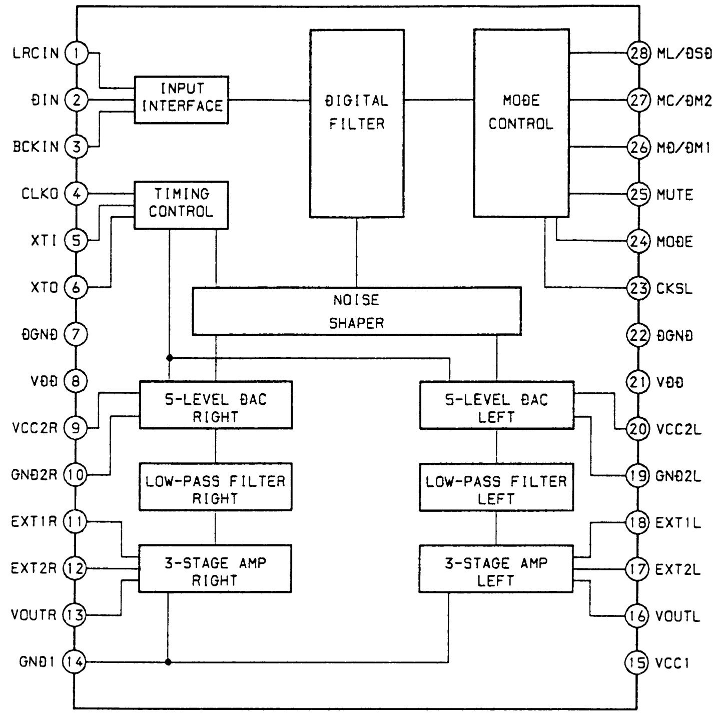
XLON
SPOD
SPOC
SPOB
SPOA
CLKO
VDD
XLTO
DATO
CNIN
SEIN
CLOK
XLAT
FOK
MON
MDP
MDS
LOCK
TEST
FILO
FILI
PCO
VSS
AVSS
CLTV
AVDD
RF
BIAS
ASYI
ASYO
ASYE
WDCK
SERVO AUTO SEQUENCER
CPU INTERFACE
SUB CODE PROCESSOR
DIGITAL CLV
DIGITAL PLL
EFM DEMODULATOR
ASYMMETRY CORRECTOR
D/A INTERFACE
DIGITAL OUT
16K RAM
ERROR CORRECTOR
CLOCK GENERATOR
DATA
XRST
SENS
MUTE
SQCK
SQSO
EXCK
SBSO
SCOR
VSS
WFCK
EMPH
DOUT
C4M
FSTT
XTSL
XTAO
XTAI
MNTO
LRCK
PCMD
BCLK
GTOP
XUGF
XPCK
VDD
GFS
RFCK
C2PO
XROF
MNT3
MNT1

IC101 L78LR05D (Main Board)

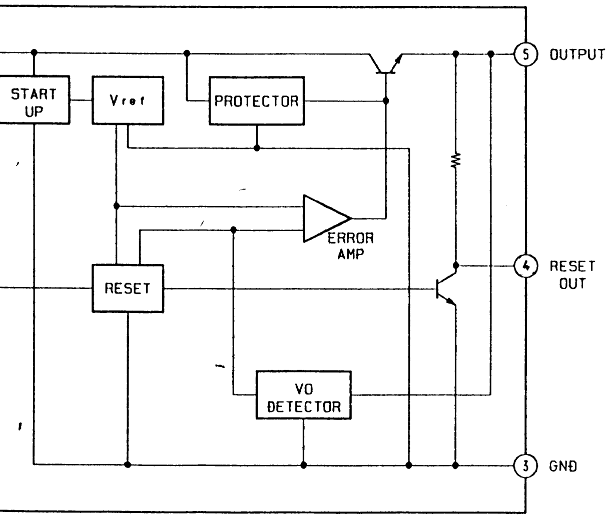


INPUT
Cd
START UP
Vref
PROTECTOR
ERROR AMP
RESET
VO DETECTOR

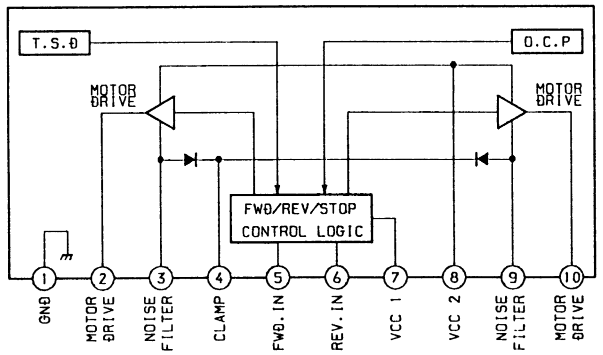
IC104 PCM1710U


LRCIN 1
DIN 2
BCKIN 3
CLKO 4
XTI 5
XTO 6
DGND 7
VDD 8
VCC2R 9
GND2R 10
EXT1R 11
EXT2R 12
VOUTR 13
GND1 14
28 ML/DSD
27 MC/DM2
26 MD/DM1
25 MUTE
24 MODE
23 CKSL
22 DGND
21 VDD
20 VCC2L
19 GND2L
18 EXT1L
17 EXT2L
16 VOUTL
15 VCC1
INPUT INTERFACE
DIGITAL FILTER
MODE CONTROL
TIMING CONTROL
NOISE SHAPER
5-LEVEL DAC RIGHT
5-LEVEL DAC LEFT
LOW-PASS FILTER RIGHT
LOW-PASS FILTER LEFT
3-STAGE AMP RIGHT
3-STAGE AMP LEFT

L78LR05D (Main Board)


START UP
Vref
PROTECTOR
ERROR AMP
RESET
VO DETECTOR
5 OUTPUT
4 RESET OUT
3 GND

IC203 LB1641

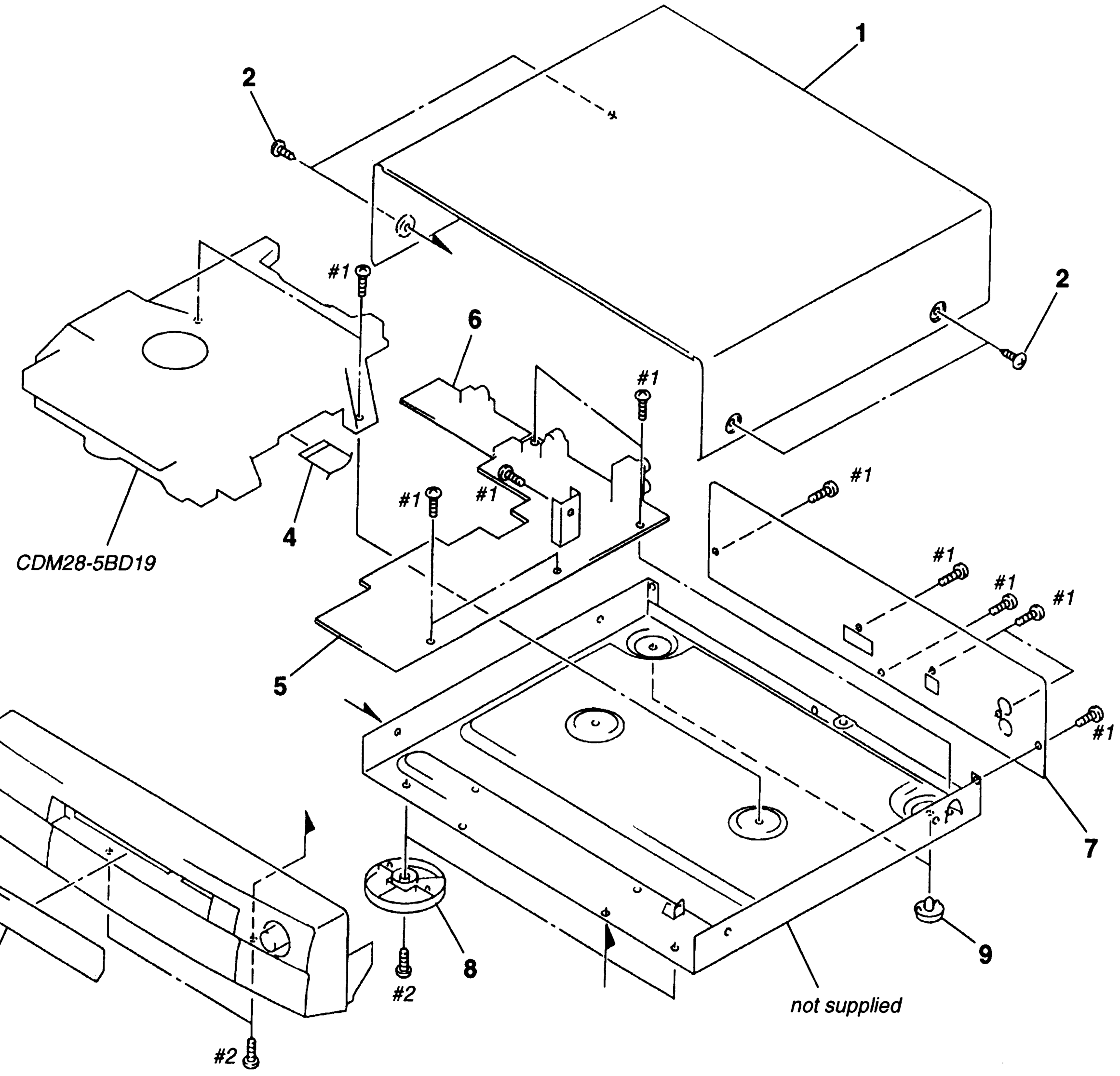

T.S.D
O.C.P
MOTOR DRIVE
MOTOR DRIVE
FWD/REV/STOP CONTROL LOGIC
1 GND
2 MOTOR DRIVE
3 NOISE FILTER
4 CLAMP
5 FWD.IN
6 REV.IN
7 VCC 1
8 VCC 2
9 NOISE FILTER
10 MOTOR DRIVE

SECTION 6
EXPLODED VIEWS

NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Abbreviation
  EA : Saudi Arabia model
  TH : Thai model
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
  Example :
  KNOB, BALANCE (WHITE) ... (RED)
  ↑ Parts Color ↑ Cabinet's Color
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

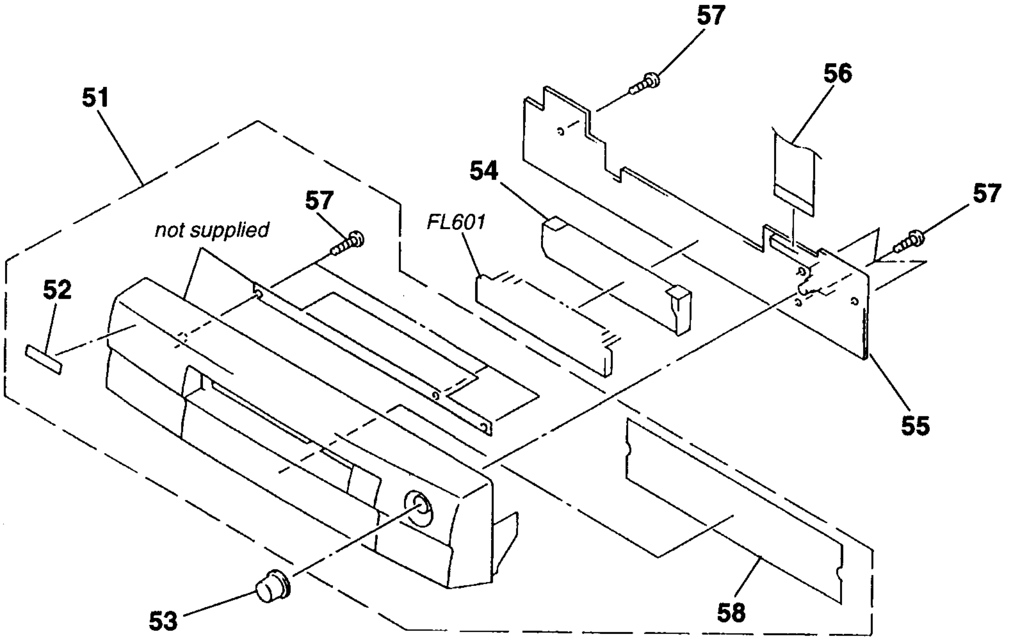
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

6-1. CHASSIS SECTION


1
2
2
#1
6
#1
#1
#1
#1
#1
#1
#1
#1
CDM28-5BD19
4
5
7
3
8
#2
#2
9
not supplied

Ref. No.	Part No.	Description	Remark
* 1	4-970-927-21	CASE (BLACK)	
* 1	4-970-927-41	CASE (SILVER)	
2	3-363-099-01	SCREW (CASE 3 TP2)	
3	4-977-986-01	PANEL, LOADING (E,EA,TH,AEP:SILVER)	
3	4-977-986-21	PANEL, LOADING (AEP,UK:BLACK)	
4	1-769-621-11	WIRE (FLAT TYPE) (19 CORE)	
* 5	A-4673-912-A	MAIN BOARD, COMPLETE (TH)	
* 5	A-4673-915-A	MAIN BOARD, COMPLETE (E,EA)	
* 5	A-4673-918-A	MAIN BOARD, COMPLETE (AEP,UK)	
* 6	1-659-178-11	CONNECTOR BOARD	
* 7	4-977-983-01	PANEL, BACK (E)	
* 7	4-977-983-11	PANEL, BACK (AEP,UK:BLACK,AEP:SILVER) (Made in France)	
* 7	4-977-983-21	PANEL, BACK (EA)	
* 7	4-977-983-31	PANEL, BACK (TH)	
* 7	4-977-983-41	PANEL, BACK (AEP:SILVER) (Made in Malaysia)	
8	4-977-699-11	LEG (F)	
9	4-965-822-01	FOOT	

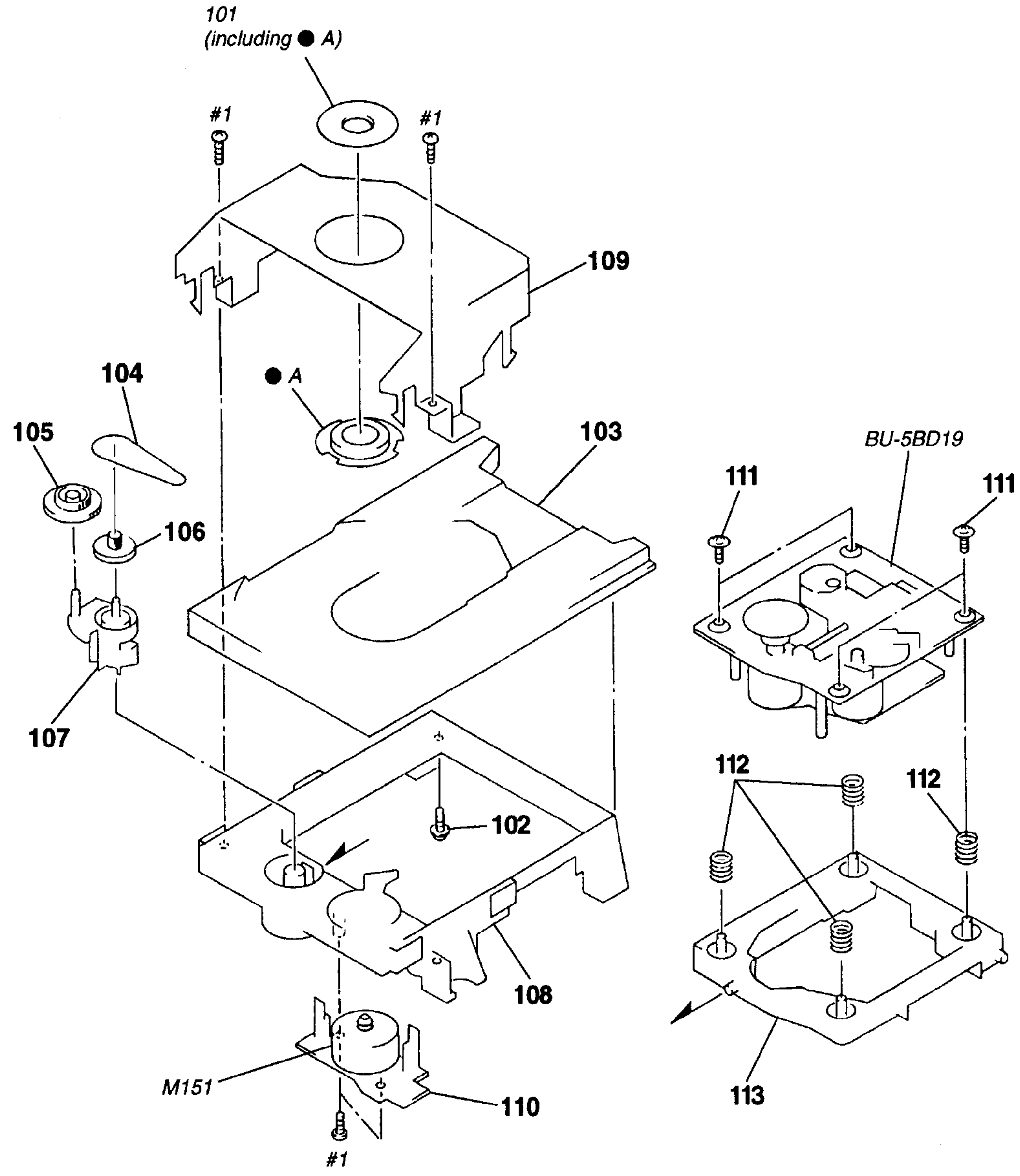
6-2. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
51	X-4946-590-1	PANEL ASSY, FRONT (E,EA,AEP:SILVER) (Made in Malaysia)	
51	X-4946-832-1	PANEL ASSY (B), FRONT (AEP,UK:BLACK)	
51	X-4946-852-1	PANEL ASSY (S), FRONT (TH,AEP:SILVER) (Made in France)	
52	4-962-708-11	EMBLEM (4-A), SONY	
53	4-977-987-01	KNOB (JOG) (SILVER)	
53	4-977-987-11	KNOB (JOG) (BLACK)	
54	4-979-797-01	HOLDER (FL)	

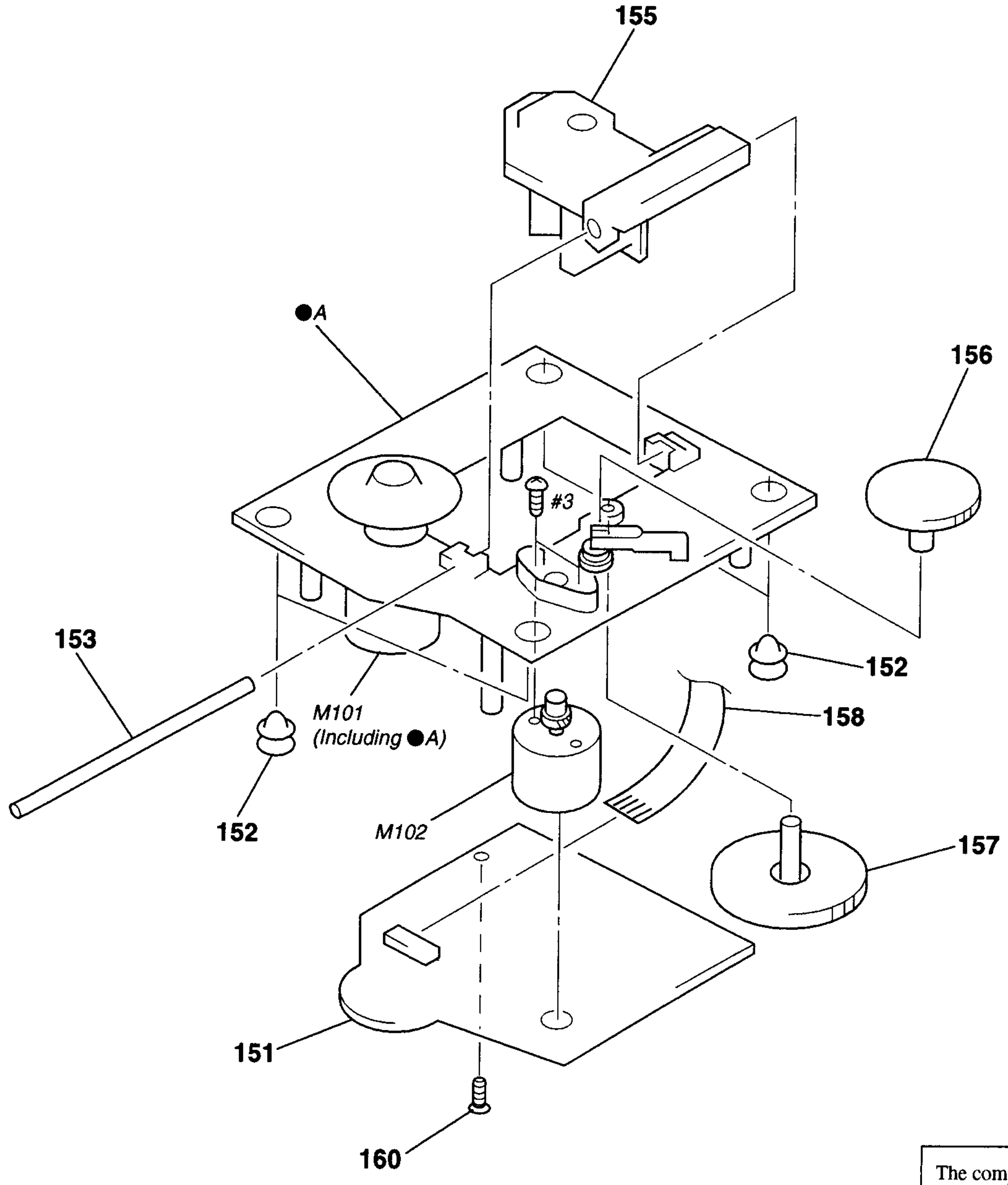
Ref. No.	Part No.	Description	Remark
* 55	A-4673-913-A	PANEL BOARD, COMPLETE (TH)	
* 55	A-4673-916-A	PANEL BOARD, COMPLETE (E,EA)	
* 55	A-4673-919-A	PANEL BOARD, COMPLETE (AEP,UK)	
56	1-776-237-11	WIRE (FLAT TYPE) (23 CORE)	
57	4-951-620-01	SCREW (2.6X8), +BVTP	
* 58	4-977-985-01	SHEET (FL)	
FL601	1-517-369-11	INDICATOR TUBE, FLUORESCENT	

6-3. CD MECHANISM SECTION (CDM28-5BD19)


101
(including ● A)
#1
#1
109
104
● A
105
103
BU-5BD19
111
111
106
107
112
112
102
108
M151
110
113
#1

Ref. No.	Part No.	Description	Remark
101	1-452-719-11	MAGNET ASSY	
102	4-917-583-21	BRACKET, YOKE	
103	4-960-836-01	TABLE, DISC	
104	4-927-649-01	BELT	
105	4-960-842-01	GEAR (P)	
106	4-960-841-01	PULLEY (S)	
* 107	4-960-839-01	CAM	
108	4-960-838-03	BASE (MD)	
109	4-960-835-01	HOLDER (M)	
* 110	1-650-836-11	LOADING BOARD	
111	4-933-134-01	SCREW (+PTPWH M2.6X6)	
112	4-959-996-01	SPRING (932), COMPRESSION	
113	4-960-834-01	HOLDER (BU)	
M151	A-4604-363-A	MOTOR (L) ASSY (LOADING)	

6-4. BASE UNIT SECTION
(BU-5BD19)


155
●A
156
#3
153
152
M101
(Including ●A)
158
152
M102
157
151
160

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
* 151	A-4673-402-A	BD BOARD, COMPLETE	
152	4-951-940-01	INSULATOR (BU)	
153	4-917-565-01	SHAFT, SLED	
⚠ 155	8-848-367-11	PICK-UP, OPTICAL KSS-213B/K-RP	
156	4-917-567-01	GEAR (M)	
157	4-917-564-01	GEAR (P), FLATNESS	
158	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)	
160	4-951-620-01	SCREW (2.6X8), +BVTP	
M101	X-4917-523-3	BASE (OUTSERT) ASSY (SPINDLE)	
M102	X-4917-504-1	MOTOR ASSY (SLED)	

BD

SECTION 7
ELECTRICAL PARTS LIST

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL:Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F:nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ, for example:
  uA.. : μA.. uPA.. : μPA..
  uPB.. : μPB.. uPC.. : μPC.. uPD.. : μPD..
- CAPACITORS
  uF : μF
- COILS
  uH : μH

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

- Abbreviation
  EA : Saudi Arabia model
  TH : Thai model

Ref. No.	Part No.	Description			Remark
*	A-4673-402-A	BD BOARD, COMPLETE ******************			
		< CAPACITOR >			
C101	1-126-607-11	ELECT CHIP	47uF	20%	4V
C102	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C103	1-164-346-11	CERAMIC CHIP	1uF		16V
C105	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C106	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C107	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C108	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C109	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C110	1-163-989-11	CERAMIC CHIP	0.033uF	10%	25V
C111	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C112	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C113	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C114	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C115	1-126-607-11	ELECT CHIP	47uF	20%	4V
C116	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C117	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C118	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C119	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C120	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C121	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C122	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C123	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C124	1-126-607-11	ELECT CHIP	47uF	20%	4V
C125	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C126	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C127	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C128	1-163-135-00	CERAMIC CHIP	560PF	5%	50V
C129	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C130	1-164-336-11	CERAMIC CHIP	0.33uF		25V
C131	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C132	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C133	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C134	1-164-346-11	CERAMIC CHIP	1uF		16V
C135	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C136	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C137	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C139	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C140	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
C141	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C142	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C145	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C146	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C147	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C148	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C149	1-164-346-11	CERAMIC CHIP	1uF		16V
C153	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C154	1-163-235-11	CERAMIC CHIP	22PF	5%	50V
		< CONNECTOR >			
CNU101	1-770-014-11	CONNECTOR, FFC/FPC 16P			
CNU102	1-770-013-11	CONNECTOR, FFC/FPC 19P			
		< IC >			
IC101	8-752-069-56	IC CXA1782BQ			
IC102	8-759-291-06	IC BA6397FP			
IC103	8-752-372-94	IC CXD2507AQ			
IC104	8-759-185-29	IC PCM1710U-B			
		< TRANSISTOR >			
Q101	8-729-010-08	TRANSISTOR MSB710-R			
Q102	8-729-424-08	TRANSISTOR UN2111			
Q103	8-729-421-22	TRANSISTOR UN2211			
		< RESISTOR >			
R102	1-216-001-00	METAL CHIP	10	5%	1/10W
R103	1-216-049-11	METAL GLAZE	1K	5%	1/10W
R104	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R105-108	1-216-093-00	METAL CHIP	68K	5%	1/10W
R109	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R112	1-216-083-00	METAL CHIP	27K	5%	1/10W
R113	1-216-083-00	METAL CHIP	27K	5%	1/10W
R114	1-216-101-00	METAL CHIP	150K	5%	1/10W
R115	1-216-101-00	METAL CHIP	150K	5%	1/10W
R116	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R117	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R118	1-216-049-11	METAL GLAZE	1K	5%	1/10W
R119	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R120	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R121	1-216-114-00	METAL GLAZE	510K	5%	1/10W
R122	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R123	1-216-099-00	METAL CHIP	120K	5%	1/10W
R124	1-216-091-00	METAL CHIP	56K	5%	1/10W
R125	1-216-069-00	METAL CHIP	6.8K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R126	1-216-063-00	METAL GLAZE	3.9K	5%	1/10W
R127	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R128	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R129	1-216-049-11	METAL GLAZE	1K	5%	1/10W
R130	1-216-079-00	METAL CHIP	18K	5%	1/10W
R131	1-216-079-00	METAL CHIP	18K	5%	1/10W
R132	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R133	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R134	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R135	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R136	1-216-073-00	METAL CHIP	10K	5%	1/10W
R137	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R138	1-216-049-11	METAL GLAZE	1K	5%	1/10W
R139	1-216-033-00	METAL CHIP	220	5%	1/10W
R140	1-216-081-00	METAL CHIP	22K	5%	1/10W
R141	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R142	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R143	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R144	1-216-073-00	METAL CHIP	10K	5%	1/10W
R145	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R146	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R147-149	1-216-049-11	METAL GLAZE	1K	5%	1/10W
R150-152	1-216-037-00	METAL CHIP	330	5%	1/10W
R153	1-216-082-00	METAL GLAZE	24K	5%	1/10W
R154	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R156	1-216-085-00	METAL CHIP	33K	5%	1/10W
R157	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R158	1-216-001-00	METAL CHIP	10	5%	1/10W
		< VARIABLE RESISTOR >			
RV101	1-241-396-11	RES, ADJ, METAL GLAZE 22K			
RV102	1-241-396-11	RES, ADJ, METAL GLAZE 22K			
RV103	1-241-396-11	RES, ADJ, METAL GLAZE 22K			
		< SWITCH >			
S101	1-572-085-11	SWITCH, LEAF (LIMIT SW)			
		< VIBRATOR >			
X101	1-579-280-11	VIBRATOR, CRYSTAL (16.9344MHz)			

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Ref. No.	Part No.	Description			Remark
*	1-659-178-11	CONNECTOR BOARD *****************			
		< CAPACITOR >			
C301	1-162-282-31	CERAMIC	100PF	10%	50V
C302	1-164-159-21	CERAMIC	0.1uF		50V
		< CONNECTOR >			
CN301	1-770-158-21	HOUSING, CONNECTOR 7P (SYSTEM CONTROL)			
CN302	1-770-031-11	CONNECTOR, BOARD TO BOARD 7P			
		< COIL >			
L301	1-410-464-11	INDUCTOR 3.3uH			
L302	1-410-464-11	INDUCTOR 3.3uH			

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Ref. No.	Part No.	Description	Remark
*	1-650-836-11	LOADING BOARD **************	
		< CONNECTOR >	
* CN291	1-568-943-11	PIN, CONNECTOR 5P	
		< SWITCH >	
S291	1-572-086-11	SWITCH, LEAF (LOAD OUT)	
S292	1-572-086-11	SWITCH, LEAF (LOAD IN)	

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Ref. No.	Part No.	Description			Remark
*	A-4673-912-A	MAIN BOARD, COMPLETE (TH)			
*	A-4673-915-A	MAIN BOARD, COMPLETE (E,EA)			
*	A-4673-918-A	MAIN BOARD, COMPLETE (AEP,UK) *********************			
	1-537-770-21	TERMINAL BOARD, GROUND			
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S			
		< CAPACITOR >			
C101	1-126-936-11	ELECT	3300uF	20%	16V
C102	1-126-968-11	ELECT	100uF	20%	50V
C103	1-126-968-11	ELECT	100uF	20%	50V
C104	1-161-494-00	CERAMIC	0.022uF		25V
C105	1-126-933-11	ELECT	100uF	20%	16V
C110	1-161-494-00	CERAMIC	0.022uF		25V
C111	1-164-159-21	CERAMIC	0.1uF		50V
C112	1-126-933-11	ELECT	100uF	20%	16V
C113	1-126-933-11	ELECT	100uF	20%	16V
C115	1-126-964-11	ELECT	10uF	20%	50V
C116	1-126-933-11	ELECT	100uF	20%	10V
C117	1-126-968-11	ELECT	100uF	20%	50V
C118	1-126-968-11	ELECT	100uF	20%	50V
C122	1-124-903-11	ELECT	1uF	20%	50V
C123	1-126-925-11	ELECT	470uF	20%	10V
C124	1-162-306-11	CERAMIC	0.01uF	30%	16V
C151-155	1-164-159-21	CERAMIC	0.1uF		50V
C156	1-161-494-00	CERAMIC	0.022uF		25V
C157	1-162-282-31	CERAMIC	100PF	10%	50V
C158	1-162-290-31	CERAMIC	470PF	10%	50V
C159-162	1-162-294-31	CERAMIC	0.001uF	10%	50V
C201	1-130-475-00	MYLAR	0.0022uF	5%	50V
C202	1-130-475-00	MYLAR	0.0022uF	5%	50V
C203	1-126-964-11	ELECT	10uF	20%	50V
C204	1-162-294-31	CERAMIC	0.001uF	10%	50V

MAIN PANEL

Ref. No.	Part No.	Description				Remark
C206	1-126-964-11	ELECT	10uF	20%		50V
C251	1-130-475-00	MYLAR	0.0022uF	5%		50V
C252	1-130-475-00	MYLAR	0.0022uF	5%		50V
C253	1-126-964-11	ELECT	10uF	20%		50V
C254	1-162-294-31	CERAMIC	0.001uF	10%		50V
C256	1-126-964-11	ELECT	10uF	20%		50V
C281-283	1-162-306-11	CERAMIC	0.01uF	30%		16V
C284	1-164-159-21	CERAMIC	0.1uF			50V
C285	1-126-963-11	ELECT	4.7uF	20%		50V
		< CONNECTOR >				
* CN101	1-691-406-11	CONNECTOR, BOARD TO BOARD 7P				
CN201	1-770-167-11	CONNECTOR, FFC/FPC 19P				
* CN203	1-568-839-11	SOCKET, CONNECTOR 23P				
		< DIODE >				
D101	8-719-200-82	DIODE 11ES2				
D102	8-719-200-82	DIODE 11ES2				
D103	8-719-200-82	DIODE 11ES2				
D104	8-719-200-82	DIODE 11ES2				
D105	8-719-200-82	DIODE 11ES2				
D106	8-719-200-82	DIODE 11ES2				
D107	8-719-982-03	DIODE MTZJ-3.6A				
D109	8-719-933-50	DIODE HZS7C2L				
D110	8-719-982-19	DIODE MTZJ-30A				
D111	8-719-200-82	DIODE 11ES2				
D112	8-719-200-82	DIODE 11ES2				
D281	8-719-109-71	DIODE RD3.9ES-B1				
		< IC >				
IC101	8-759-805-37	IC L78LR05D				
IC102	8-759-231-53	IC TA7805S				
IC201	8-759-900-72	IC NE5532P				
IC202	8-749-923-04	IC TOTX178 (CD DIGITAL,OPTICAL)				
IC203	8-759-822-09	IC LB1641				
		< JACK >				
J201	1-770-272-11	JACK, PIN 2P (CD)				
		< TRANSISTOR >				
Q101	8-729-900-80	TRANSISTOR DTC114ES				
Q102	8-729-118-00	TRANSISTOR 2SB1116-L				
Q103	8-729-030-18	TRANSISTOR 2SD2525				
Q104	8-729-019-64	TRANSISTOR 2SB1041				
Q105	8-729-119-76	TRANSISTOR 2SA1175-HFE				
		< RESISTOR >				
R101	1-249-437-11	CARBON	47K	5%	1/4W	
R102	1-249-413-11	CARBON	470	5%	1/4W	
R103	1-249-413-11	CARBON	470	5%	1/4W	
R104	1-247-807-11	CARBON	100	5%	1/4W	
R107	1-249-417-11	CARBON	1K	5%	1/4W	

Ref. No.	Part No.	Description				Remark
R108	1-249-441-11	CARBON	100K	5%	1/4W	
R110	1-249-429-11	CARBON	10K	5%	1/4W	
R112	1-249-419-11	CARBON	1.5K	5%	1/4W	
⚠ R114	1-219-139-11	FUSIBLE	0.68	10%	1/4W	F
⚠ R115	1-217-641-00	FUSIBLE	4.7	5%	1/4W	F
R116-121	1-260-091-11	CARBON	220	5%	1/2W	
R130	1-249-417-11	CARBON	1K	5%	1/4W	
R131	1-247-791-00	CARBON	22	5%	1/4W	
R201	1-249-421-11	CARBON	2.2K	5%	1/4W	
R202	1-249-421-11	CARBON	2.2K	5%	1/4W	
R205	1-249-441-11	CARBON	100K	5%	1/4W	
R207	1-249-421-11	CARBON	2.2K	5%	1/4W	
R208	1-249-429-11	CARBON	10K	5%	1/4W	
R209	1-249-428-11	CARBON	8.2K	5%	1/4W	
R210	1-249-441-11	CARBON	100K	5%	1/4W	
R211	1-247-807-11	CARBON	100	5%	1/4W	
R251	1-249-421-11	CARBON	2.2K	5%	1/4W	
R252	1-249-421-11	CARBON	2.2K	5%	1/4W	
R255	1-249-441-11	CARBON	100K	5%	1/4W	
R257	1-249-421-11	CARBON	2.2K	5%	1/4W	
R258	1-249-429-11	CARBON	10K	5%	1/4W	
R259	1-249-428-11	CARBON	8.2K	5%	1/4W	
R260	1-249-441-11	CARBON	100K	5%	1/4W	
R261	1-247-815-00	CARBON	220	5%	1/4W	
R601	1-249-425-11	CARBON	4.7K	5%	1/4W	
R602	1-249-425-11	CARBON	4.7K	5%	1/4W	

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*	A-4673-913-A	PANEL BOARD, COMPLETE (TH)				
*	A-4673-916-A	PANEL BOARD, COMPLETE (E,EA)				
*	A-4673-919-A	PANEL BOARD, COMPLETE (AEP,UK)				
		**********************				
*	4-979-797-01	HOLDER (FL)				
		< CAPACITOR >				
C602	1-164-159-21	CERAMIC	0.1uF			50V
C604	1-164-159-21	CERAMIC	0.1uF			50V
C605	1-164-159-21	CERAMIC	0.1uF			50V
C606	1-162-301-11	CERAMIC	0.0015uF		30%	16V
C607	1-162-301-11	CERAMIC	0.0015uF		30%	16V
C608	1-126-177-11	ELECT	100uF		20%	10V
C609	1-124-916-11	ELECT	22uF		20%	63V
C610	1-162-306-11	CERAMIC	0.01uF		30%	16V
C631	1-162-286-21	CERAMIC	220PF		10%	50V
C632	1-162-282-31	CERAMIC	100PF		10%	50V
C674	1-162-290-31	CERAMIC	470PF		10%	50V
		< CONNECTOR >				
* CN601	1-568-865-11	SOCKET, CONNECTOR 23P				

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.

PANEL

Ref. No.	Part No.	Description				Remark
		< DIODE >				
D601	8-719-815-85	DIODE 1S1585				
D602	8-719-815-85	DIODE 1S1585				
D603	8-719-815-85	DIODE 1S1585				
		< FLUORESCENT INDICATOR TUBE >				
FL601	1-517-369-11	INDICATOR TUBE, FLUORESCENT				
		< IC >				
IC601	8-759-340-60	IC uPD78044AGF-091-3B9				
		< TRANSISTOR >				
Q601	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q651	8-729-119-78	TRANSISTOR 2SC2785-HFE				
Q652	8-729-119-78	TRANSISTOR 2SC2785-HFE				
		< RESISTOR >				
R603	1-249-417-11	CARBON	1K	5%	1/4W	
R604	1-249-417-11	CARBON	1K	5%	1/4W	
R605-607	1-249-429-11	CARBON	10K	5%	1/4W	
R608	1-249-393-11	CARBON	10	5%	1/4W	
R609-611	1-249-429-11	CARBON	10K	5%	1/4W	
R612	1-249-413-11	CARBON	470	5%	1/4W	
R613	1-249-415-11	CARBON	680	5%	1/4W	
R614	1-249-417-11	CARBON	1K	5%	1/4W	
R615	1-249-413-11	CARBON	470	5%	1/4W	
R616	1-249-415-11	CARBON	680	5%	1/4W	
R617	1-249-413-11	CARBON	470	5%	1/4W	
R618	1-249-415-11	CARBON	680	5%	1/4W	
R619	1-249-417-11	CARBON	1K	5%	1/4W	
R620-622	1-249-423-11	CARBON	3.3K	5%	1/4W	
R624	1-249-425-11	CARBON	4.7K	5%	1/4W	
R625	1-249-425-11	CARBON	4.7K	5%	1/4W	
R626-629	1-247-807-11	CARBON	100	5%	1/4W	
R631	1-249-429-11	CARBON	10K	5%	1/4W	
R651-674	1-249-441-11	CARBON	100K	5%	1/4W	
R675	1-249-429-11	CARBON	10K	5%	1/4W	
R676	1-249-441-11	CARBON	100K	5%	1/4W	
R677	1-249-429-11	CARBON	10K	5%	1/4W	
R681-683	1-247-807-11	CARBON	100	5%	1/4W	
R685-688	1-247-807-11	CARBON	100	5%	1/4W	

Ref. No.	Part No.	Description	Remark
		< SWITCH >	
S601	1-554-303-21	SWITCH, TACTILE (EDIT)	
S602	1-554-303-21	SWITCH, TACTILE (CHECK)	
S603	1-554-303-21	SWITCH, TACTILE (CLEAR)	
S604	1-554-303-21	SWITCH, TACTILE (▶▶)	
S605	1-554-303-21	SWITCH, TACTILE (TIME)	
S606	1-554-303-21	SWITCH, TACTILE (REPEAT)	
S607	1-554-303-21	SWITCH, TACTILE (PLAY MODE)	
S608	1-554-303-21	SWITCH, TACTILE (▷ ❚❚)	
S609	1-554-303-21	SWITCH, TACTILE (■)	
S610	1-554-303-21	SWITCH, TACTILE (⏏ OPEN/CLOSE)	
S611	1-554-303-21	SWITCH, TACTILE (◀◀)	
S612	1-467-938-11	ENCODER, ROTARY (⏮ AMS ⏭)	
		< VIBRATOR >	
X601	1-579-233-11	VIBRATOR, CERAMIC (5MHz)	

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MISCELLANEOUS

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Ref. No.	Part No.	Description	Remark
4	1-769-621-11	WIRE (FLAT TYPE) (19 CORE)	
56	1-776-237-11	WIRE (FLAT TYPE) (23 CORE)	
101	1-452-719-11	MAGNET ASSY	
⚠ 155	8-848-367-11	PICK-UP, OPTICAL KSS-213B/K-RP	
158	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)	
M101	X-4917-523-3	BASE (OUTSERT) ASSY (SPINDLE)	
M102	X-4917-504-1	MOTOR ASSY (SLED)	
M151	A-4604-363-A	MOTOR (L) ASSY (LOADING)	

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HARDWARE LIST

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Ref. No.	Part No.	Description	Remark
#1	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#2	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#3	7-621-255-15	SCREW +P 2X3	

The components identified by mark ⚠ or dotted line with mark. ⚠ are critical for safety.
Replace only with part number specified.